

CYI Gemini 12, Canary Cap Com, did you call.

S/C Gemini 12, go ahead.

CYI No, did you call us down here.

S/C Roger, As a matter of /^{interest} Canaries, We have just trying to repressurize the cockpit and we /^{were} using emergency O₂ /^{in the ELSS} to repressurize and my eyes began to smart, they burn very badly until we got the pressure up. I went to to see if it would stop it, but it didn't. There is a faint odor in my suit, but I couldn't tell exactly what it was. As soon as I opened up the visor the stickness and smartness of my eyes went away.

CYI Okay, how do they feel now.

S/C They are feeling okay now. It felt at first like a smog or perspiration was in my eyes.

CYI Roger, I copy that.

S/C And as I tried to point the bars, the perspiration got worse.

CYI Okay, I understand they have cleared now and you are feeling better now, right.

S/C Right

CYI Okay, we got about a minute to LOS there and we will be standing by.

S/C Okay.

CYI Cabin pressure 5.61 and holding.

HOU Roger

CYI Did you copy that about his eyes smartting.
HOU Copy.
CYI Okay, he is back on flow now.
HOU Okay
CYI Canary LOS
KNO Kano remote.
Canary local.
... Good job.
HOU Gemini 12, Houston Cap Com through Kano - over.
S/C Go ahead, Houston
HOU Roger, Gemini 12, we suggest you go off vox
and back to "push to talk".
S/C Say again.
HOU Gemini 12, Houston Cap Com suggest you go off
vox and go back to "push to talk."
S/C Will do.
HOU Be sure your cabin is 5.6. Looks mighty fine
on the ground, real nice job.

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/13/66, 11:59 a.m. Tape 167, Page 1

Gemini Control Houston, we are still monitoring our pass over Kano, no conversation at this time. We have been advised that the hatch open time that we read here in Mission Control was 42 hours, 46 minutes even, Ground Elapsed Time, slightly ahead of our initial schedule, and the hatch locked time read here was 44 hours, 55 minutes, 25 seconds and as Bill Anders had advised the Gemini 12 crew, Jim Lovell and Buzz Aldrin, this is a new EVA record. Continuing to stand by, this is Gemini Control Houston.

This is Gemini Control Houston, 45 hours, 15 minutes now into the flight of Gemini 12. We are at the tag end of our Kano pass now and no further conversation is expected with the crew. We will shortly be going out of range with the Gemini 12 spacecraft. The record established this morning, by the way, with Astronaut Buzz Aldrin, represents a cumulative record which includes yesterday's standup EVA, so at 45 hours, 16 minutes, this is Gemini Control Houston.

END OF TAPE

This is Mission Control Houston, let's join the conversation that's in progress between spacecraft Gemini 12 through the Tananarive voice remoting station.

S/C Garbled

CAP COM I'm sorry, 12, the com isn't too good, would you say again slowly, please?

S/C Roger, I've noticed....circuit breaker was opened, I think that was accidentally done during ingress, no problem.

CAP COM Roger, we copy.
12, Houston, when you have a chance, if you remember, did you get much roll when you were doing your yaw and direct?

Lovell That's affirm, Houston, when we started to yaw we did a roll.

CAP COM Houston copied, thank you.
12, Houston, you don't have to acknowledge, but I'd like to talk to you a minute and say that we see no problem with the tether exercise in rate command, however, we would like for you to turn the number 2 and number 4 circuit breaker off and the reason for that is if we have a cold problem every time you flow monopropellant you would continue to keep it cool and possibly by leaving them off for a while, and in the sunshine they warm up we might get them back later. Over.

GEMINI 12 MISSION COMMENTARY, 11/13/66, 12:09 p.m. Tape 168, Pg 2

Lovell This is 12. I understand you see no problem. I
understand to turn circuit breakers 2 and 4 ...

CAP COM That's right, because if you flow propellant out
of them and there's no firing, they'll just get
colder, and this way you won't flow many propellant
out of them, and if there is a freezing problem
in the solenoid area they may warm up eventually
and we'll check them later after the tether.

Aldrin Roger

CAP COM Gemini 12, we have about 30 seconds to LOS.
Standing by.

This is Mission Control Houston, 45 hours, 30 minutes and
9 seconds after liftoff. We have had loss of signal from the
Tanarive voice remoting station, we'll be coming up over
Carnarvon, Australia in approximately 7 minutes from this time.
Meanwhile the change of shift press conference should begin
in approximately 15 minutes, at 12:30 CST. Participants in the
press conference will be Mr. William Schneider, who is Gemini 12
Mission Director, Clifford Charlesworth, the Green Team Flight
Director, Dr. Charles A. Berry, who has been on the medical,
aeromedical console most of the morning during the umbilical
EVA, and Gene Cernan who is Gemini 12 backup pilot, who has been
monitoring EVA from the spacecraft communicator console. At
45 hours, 31 minutes and 10 seconds after liftoff, this is Mission
Control.

END OF TAPE

This is Mission Control Houston. The Carnarvon Australia tracking station has had telemetry and ac-aid contact with spacecraft Gemini 12. As yet the spacecraft communicator at Carnarvon Jim Fucchi has not put in a call to the crew, and now he is checking the various ground readouts on the spacecraft conditions. We will standby for him to put in a call to the crew. This particular pass^{over} Carnarvon station will last approximately eight minutes and 17 seconds.. Mission stands at 45 hours, 38 minutes, 15 seconds. Still quiet on the air-ground over Carnarvon. He is putting in a call now, let's join them.

CRO Gemini 12, Carnarvon.

S/C Carnarvon, 12.

CRO Okay, would you go to Command on your TM switch please.

S/C Roger - TM is command. We may have uncovered what the problem was with Jim's eyes. The ~~By~~ camera that came from the adaptor, if you recall, stopped working after originally reported as working. It didn't take any film at all, and seems to have over-heated because I guess we turned it on while the sun was still up. What we would like to know - we are going to store it in a plastic bag, and we would like to know if anybody on the ground has any desire to have the over-heated camera back, or shall we jettison it tomorrow.

HOU Standby

CRO Okay, standby on that end.

... I am going to ship you up to TX.

CRO Okay, we have a purge. Over this section we want to purge section 1, then section 2, thirty seconds on the O₂.

S/C Okay, how many minutes do we have.

CRO Oh, we have a little while, about six.

HOU About six.

S/C Okay, understand fuel cell purge, which section first. 30 seconds O₂.

CRO Right, Section 1 and then section 2.

ASC Carnarvon, ASC - have you got C-band track.

CRO That's negative.

HOU Carnarvon, we would like to have C-band track, see if you can get it.

CRO I'll go down and take care of that myself.

HOU Okay.

HOU Carnarvon, do you have S-band track.

CRO That's negative.

HOU Roger.

CRO We have a C-band skin track.

S/C Fuel cell purge is complete.

CRO Roger

CRO Just a short flight plan update in about seven minutes at 45:50:00, we want a gyrocompass to 000 that's Agena 01800.

S/C Understand seven minutes gyrocompass 000, and Agena 01800.

CRO That's affirmative. Now replace your cryo switch
to H₂ please.

HOU Carnarvon, Flight.

CRO Go ahead.

HOU Contingency Delta on the Agena please.

CRO Roger.

CRO Okay, you can go back to O₂ thank you.

S/C Carnarvon, Gemini 12.

CRO Go ahead.

S/C Roger - Our digital clock stopped at 45:14:00
have you got the time there.

CRO Okay, I'll give you a mark at 45:45:30.

S/C Okay, standby, it will take a while handle it.

CRO Okay, you got about thirty seconds.

S/C We can't seem to get it to going forward.

CRO Okay.

S/C Naw - it won't crank forward or backward, we
will look into it some more.

CRO Okay

S/C We'll shake it around a bit.

CRO Roger.

HOU Is SET still carrying on your telemetry -
Carnarvon.

CRO That's affirmative.

HOU Is it in Sink.

CRO Well, we just lost sight, it was in Sink, I
checked it when he told me about that clock.

CRO We have LOS both parameters. Both vehicles and
all systems were GO.

And this is Mission Control Houston. During that just completed
pass over the Carnarvon, Australia tracking station, the crew
conducted a purge of the fuel cell system. They are still in
what is called post-EVA period, coming up on an eat period at
46 hours, 20 minutes ground elapsed time during the upcoming
pass over the states. At 45 hours, 47 minutes and 1 seconds
after the liftoff this is Mission Control. We now join the
press conference in progress.

END OF TAPE

This is Mission Control, Houston at 46 hours 35 minutes and 40 seconds after lift-off. We have just had loss of signal through the Antigua station of the Eastern Test Range. At the end of this state side pass, we have an accumulation of more than 20 minutes of voice air-to-ground tapes beginning back at the Canton Island voice remoting station through the Hawaii station and we have just completed state side pass. Let's go back and listen to those tapes now.

HOU Canton go remote.

CTN Roger. Canton remote.

S/C Say, do you us ...Agena around...spacecraft in the other direction.

HOU That is affirmative spacecraft SEF.

S/C We are having a hell of a time when we place the spacecraft in an inertial roll ... to get this ...we are all out of ... We are going to let it go we get the spacecraft straightened up and then we will work on it.

HOU Roger. And would you check your tone VOX circuit breaker there for your clock problem. Have you got that straightened out?

S/C That is the first thing we said... the circuit breaker is ... and that doesn't do it.

HOU Well, there is two circuit breakers. Electric timer and tone locks.

S/C Well, we checked both of them.

HOU Okay. And your clock is stuck. Is that correct?

S/C

HOU Okay, you now have the clock. Is that correct?

S/C Houston, 12 here. What I meant to say was the combination ... we don't seem to be able to exercise proper control in rate command or in direct with our own attitude system. Now, it may be that... I think we want to get to a particular area...

HOU Roger.

S/C How do you feel about that?

HOU Okay, what is your approximate heading right now?

S/C Well,...back...

HOU You say you are upside down?

Roger, you say you are upside down? Is that correct?

S/C Roger.

HOU Okay, my suggestion is, if you can roll any where near right side up, go ahead to FC-2 and set up the

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HOU commands for zero zero zero and forget it.

S/C Okay, we will do that. I think the problem is the combination... when we roll one way we lose control we seem to lose control and when we put the control the other way, we lose...

HOU Yes, I can understand that. Also we looked at some vehicle rates for your combined weight and you can, if you have 8/10ths of a degree per second, in yaw, why the whole combination in FC-1 would go 360 degrees before it would stop with the attitude thrusters. So we feel that the problem is just getting just letting it sit there long enough for it to right itself total combination with the low gas pressures.

S/C Okay...

HOU That is affirmative. And so if you get it anywhere near upright so the horizon sensors see some of the earth, and set up FC-2 0000 with gyro compassing I think you will find that it will eventually come around. It may take a while, but everything looks good here.

S/C ...

HOU We have about 3 minutes and we are standing by.

We will see you over the States.

12, Houston. 1 minutes until Hawaii acquisition and
we will leave you until Hawaii.

S/C Roger. We have the commands setup now and we are

...

HOU Okay, just bear with it. It is just that is so
darned heavy that it is just not going to move
very fast for you and it will overshoot the dead-
bands.

S/C Am reading about 28 percent...

HOU Roger. Understand 28 percent attitude gas.

S/C That is 20.

HOU Two zero. Roger. 20. You guys did real well.
You get things squared away and take your time
and rest. We have plenty of time here.

HOU Canton local.

HAW We have got him here at Hawaii.

12, Hawaii. Standing by.

HOU Hawaii, Flight.

HAW Roger.

HOU GC would like to know if the circuit breaker 2 and 4
are off.

HAW We concur on the ground. We have 2 and 4 off.

HOU Okay.

HAW We have one question. We are looking at the dome here and it looks like it should be somewhere around 800 psi on cyro 2.

12, Hawaii. I am sending you TX.

S/C It looks like we are down to about 15 percent attitude gas on closer inspection.

HAW Roger.

HOU Hawaii Com, Flight.

HAW Go, Flight.

HOU Tell them when it gets close to right, go to FC-1 and be sure he puts 460 gains low in.

HAW 12, Hawaii. When you get close to being the right attitude go to FC-1 and make sure that you do get 460 in.

S/C Roger.

HAW That is gains low.

Flight, did you copy that okay, that he was showing 15 percent on attitude gas on closer inspection.

HOU Roger, we copied 15 percent.

HAW Roger.

HOU What is the pump configuration, Hawaii.

HAW They have got primary A secondary B.

HOU Tell them to go to both A's.

HAW Okay. 12, Hawaii. We would like to have you to
go to both A pumps on.

S/C Roger. Thank you.

HOU Hawaii Flight. Continuity India on the
Agena, please?

HAW We sent one. Do you want another one?

HOU Okay, we want another one at LOS.

HAW Okay.

S/C We are in flight control mode 1, now. We overshot
to the right a little bit. And it looks like it is
going back.

HAW Roger, very good.

12, Hawaii, we will have LOS in about a minute.

END OF TAPE

HAW Roger, very good.
12, Hawaii, we'll have LOS in about a minute.

S/C Roger

Haw ...and it looks like the Agena is settling
down a little. That's 000 on the spacecraft.
Hawaii has LOS.

HOU California remote

CAL California is remoted

CAP COM Gemini 12, Houston standing by at California,
have about three or four or five items to
talk to you about, when you have a chance.
Gemini 12, Gemini 12, Houston, over.

S/C Go ahead, Houston.

CAP COM Roger, I've got five or six items to discuss
with you when you have a chance.

Lovell Ok, let me get my book out here.

CAP COM Ok, the first thing was, did you jettison
anything that you didn't plan to during your
EVA for eight purposes here?

Lovell I don't believe so. The waist tethers are gone,
the handrail is gone.

CAP COM Ok. And if Buzz has a chance, could he give us
an idea as to which flow modes he used on the
ELSS, we seem to have picked up quite a bit of
oxygen and we were interested.

Aldrin Roger, it was on medium for a short while prior to egress, went to high for egress and I was on high for the entire time.

CAP COM Roger, ok, thank you. And Jim, I gather you didn't have any more problems with your lap belt, it apparently wasn't hooked up right, is that correct?

Lovell That's right.

CAP COM Ok, and with regard to the camera, we would like to have it back. If you think its causing any problems ^{with fumes} / if you could get it in the right aft box and leave it there, if not and its causing a problem, go ahead and get rid of it.

Lovell Ok, we have it in the zipper bag, we'll just stick it in the aft box shortly.

CAP COM Ok, I sorta gathered that you got your fumes in your eyes there while you still on the suit loop which shouldn't really come from the camera in the cabin.

Lovell You're right. That's true. Unfortunately... it wasnt the oil film.

CAP COM Ok, fine.

Lovell Perspiration going into the eyes, digging into the eyes, and the more you blink, the more you water, the more it gets. Now I don't know whether this is a natural condition or if this is something around the eye and there would be tears that causes

irritation.

CAP COM Ok, fine. Do you want me to sync your GET
for you.

Lovell Love to.

CAP COM Ok, why don't I give you a while to set up the
clock. Why don't you set it up for 46 hours,
20 minutes, 00 seconds and you have about 2 and
1/2 minutes to go.

Lovell Roger, 46, 20, 00.

CAP COM Ok, and in the meantime, in order to save
electrical power, when you are satisfied in
your tether exercise that you no longer need
your local vertical needles, why don't you just
plan to turn your computer off.

Lovell We think we ought to discuss this attitude control
problem a little bit before we go leaping into
this tether exercise. I'm not convinced that
for one we can pitch the Agena down and maintain
a straight down attitude.

CAP COM Ok, we were going to talk to you about that in a
little bit, we were discussing it right now ourselves.

HOU Guaymas remote, California local.

GYM Guaymas remote

CAL California local

CAP COM Ok, you've got about 1 and a half minutes to clock sync and Buzz, do you remember whether the 408 blume was deployed correctly when you were out?

Aldrin No, I...its on the bottom if I'm not mistaken. I didn't get a chance to look down there.

CAP COM Very good, thank you. You might could consider while we are discussing the thruster problem, i you can use the Agena to pitch down with, of course, and if you are not familiar with that, I think you have it in the book there, we can work something out by pitching, using the Agena control system to pitch you down, we're discussing exactly your control problem right now and we'll have an answer for you.

Aldrin Yeah, ok. We should station keep after we undock.

CAP COM Yeah, we are working on that. Also, 12, did you notice any tendency to float up any with the ELSS on? When you were standing in the cockpit?

Aldrin Negative.

CAP COM Ok.

Aldrin I'll expand on that later.

CAP COM Fine. Ok, ten seconds to clock start, 5 seconds, 2, 1, Mark. The time is 46 20 00.

Lovell Roger.

CAP COM Ok, I'll give you a hack at 46 20 15 to check it. Stand by. Mark. 46 20 15.

Lovell Roger, thank you.

CAP COM Okeydoke. I have a couple of updates here for you if you are ready to copy them.

Lovell Roger, go ahead.

CAP COM Ok, 46 20 00 to 47 00 is an eat period, if you are stowed, and we have down here the sunrise time for the start of the tether exercise as 47 18 00. We would like a fuel cell purge at 49 13 00, it will be at Hawaii with a cryo readout and it will be section 2, then section 1 and I have a node update for you.

Lovell Hang on a moment. (Pause) When do you want the fuel cell purge to start?

CAP COM 49 13 00 - it'll be at Hawaii and they'll call you.

Lovell Ok. Ready for the node.

CAP COM Ok, 46 00 06 node, a rev 29 17 0.9 West, right Ascension 10 hours 54 minutes.

Lovell Roger, understand.

CAP COM 12, one other question, for you separation maneuver which will be a posigrade burn of approximately 6 feet per second horizontal, what's your druthers? Do you want to use the aft firing thrusters or the forward firing

thrusters, we'll pass it to you either way.

Lovell

We'll use the aft firing thrusters.

CAP COM

Roger, aft firing thrusters posigrade.

12 Houston, with regard to the thrusters, what we would like for you to do is to turn the number 2 and the number 4 circuit breaker back on, - the roll logic switch in the normal position, with yaw, and go ahead and undock that way and we think that you should have fairly good attitude control at that time in rate command, and of course if you are not satisfied with it, why you can always get rid of the tether.

Lovell

Well, this is a change in our procedures, Houston. We were going to start with the Agena vertical, do you want us to leave it horizontal then, or what.

CAP COM

No, let's see. You were going to fly it down there with the Gemini, and you can fly it down there with the Agena, and stop it; and then undock in rate command.

Lovell

Ok, I was just curious about our Agena attitude gas.

CAP COM

Roger.

Lovell

Houston, 12 here. We didn't get what you would call an acceptable rate command before, rate

command capability and I'm wondering if maybe we hadn't ought to check and see if we have lost another thruster.

CAP COM

Ok, let us kick that one around here for a minute and we'll talk to you again.

Aldrin

Ok, but for sure, when we went to rate command there, it wasn't acceptable and it wouldn't stop us, is what I am trying to say. We still had a residual rate.

CAP COM

Roger. Well, of course you are going to have 2/10ths of a degree per second and at that time you had the number 2 and number 4 circuit breaker off, and even monopropellant

END OF TAPE

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HOU number 2 and 4 circuit breaker off and even
 mono-propellant or part-by propellants you
 are going to get some help from them and that
 might change the picture a little. I agree
 with you when you are on that heavy burn, you
 don't get a lot of good response to begin with.

S/C Roger.

HOU 12, Houston. Your wives are out here and they
 are real happy with your show this morning.

ALDRIN Roger.

LOVELL Roger.

HOU 12, Houston.

S/C Go ahead.

HOU Okay, I am afraid that if you start checking
 thrusters on the Agena you get that combination
 moving again, the consensus of the opinion down
 here is let's get set up to do it and then you
 can use the pitch mode on the Agena to get pitch
 down. You go ahead and dock. Now, leave the 2 and
 4 circuit breakers on and if you aren't too happy
 with the control mode after you undock you might
 go ahead and change your roll logic switch to the
 other one, but one thruster may be a little bit
 better than the other and it would give you a
 a little better control that way, say for roll
 and if you are not satisfied with it, why just

HOU go ahead and get rid of the docking bar and then you can go on back away. You can go ahead, if you have got a fairly slack tether out there you might give it a couple of tries and go right back to rate command again.

S/C Roger. That is exactly what we are going to do. We had control troubles, we are going to jettison.

HOU Very good. We concur. Okay 12, Houston. When you use the Agena to pitch why remember to get 420 in there pitch rate low so you have the one and a half degree per second pitch rate rather than the 3 degree per second.

S/C Roger.

GTI LOS Turk.

This is Mission Control Houston again. Let's join the conversation in progress through the Tananarive voice remoting station.

S/C We are trying to get the spacecraft down now. We are pointing straight down.

HOU Roger. I won't bother you.

S/C Ready for update.

HOU Roger. This is for 32-4 Bravo GETRC 50 plus 26 plus 21.

R RET 400K 20 plus 45 RETRB 26 plus 10 roll left 80, roll right 100. Area 33-4 Alpha GETRC 52 plus 02 plus 21. RET 400K 20 plus 15 RETRB 25 plus 34 roll remains the same weather is good in both areas and this is with

HOU a separation maneuver. Over.

S/C Understand. Say again for RETRB 34-4 A.

HOU RETRB 25 plus 34.

S/C Roger, understand.

HOU How are you coming with getting it pitch down? All right.

S/C Roger. We are pitched down all right.

HOU Very good.

S/C Houston.

HOU Go ahead.

S/C We went through the proper procedures and got
90 degrees down and we are in flight control mode ..

HOU Understand. You are in FC-2 and you are slowly
drifting.

S/C Right. ...we back up we went through the procedures
as described and we headed down hill 90 degrees
down and stopped and then we went to flight control
mode 2. Do you read me. And we are slowly coming
back up.

HOU Roger. If you pitch down 000 you should be geo
rate normal. Roger that is right geo rate reverse.
And you say it is drifting back up?

HOU 12, Houston.

TAN Tananarive LOS.

And this is Mission Control Houston. We have had loss of signal at the Tananarive voice remoting station. And also the accumulated backlog of ~~air-to-ground~~ voice tapes during the recent state side pass has been rerun. Upcoming in this mission is the 4th undocking and the start of the tether exercise. This will occur at 47 hours 18 minutes ground elapsed time, which is about 13 minutes from now over the Carnarvon station. Tomorrow's standup EVA exercise will occur at the EVA preparations will begin at 61 hours 30 minutes and the hatch will be opened at 63 hours and 30 minutes ground elapsed time. The particular star fields which will be photographed during this EVA will be any daytime stars that can be seen plus the star Orion and portions of the Milky Way. On today's umbilical EVA, the EVA actually began at 42 hours 46 minutes ground elapsed time and occurred right at apogee of 161 nautical miles. We will be acquiring the Carnarvon Australia tracking station at in approximately 6 minutes. We will come back up at that time and listen in on the conversation between Carnarvon and the crew of Gemini 12 at 47 hours 7 minutes and 1 second after lift-off, this is Mission Control.

END OF TAPE

This is Mission Control Houston at 47 hours, 12 minutes and 54 seconds after liftoff. Should be crossing the acquisition range on the Carnarvon, Australia tracking station momentarily. We will standby for acquisition signal and voice contact between the spacecraft communicator out at Carnarvon, Jim Fucchi, and the crew of Gemini 12. We are some five minute away from the fourth undocking and the start of the Tether extension. Standing by for Carnarvon. This is a fairly high elevation angle pass, almost over the Zenith of the Carnarvon station. Let's join the conversation at Carnarvon.

S/C Go ahead Carnarvon.

CRO Okay, when you get her ^{pitched} down there, you have to put on that G O rate in order to keep that thing going around, that's command 351, we show it OFF on the ground.

S/C Roger.

HOU And make sure it is reversed Carnarvon. How does it look to you.

CRO It is in reverse Flight.

HOU Okay.

CRO Sending you a TX, 12.

S/C Roger.

HOU Carnarvon from Flight.

CRO Go ahead.

HOU What attitude are you on, in the platform.

CRO Okay, we are showing 27000.

HOU Okay.

HOU Carnarvon, would you please send us a couple of summaries, Gemini and Agena Main.

CRO Roger

HOU Contingency india Agena please.

CRO Roger

HOU Carnarvon from Flight

CRO Go ahead

HOU Okay, just standby out there Jim unless he calls you.

CRO Okay.

CRO Okay, he was is FC-2 when we saw him and he - the G O rate was off, and he turned the ACS OFF and that kinda stabilized it a little bit. Now he has the ACS back ON again.

HOU Okay, and how is G O rate.

CRO G O rate is on.

HOU Okay, and it is reversed?

CRO That is affirmative.

HOU Okay - sounds good.

S/C Carnarvon, 12.

CRO Go ahead

S/C Roger, we are in a verticle position. We are going to wait until we get a light on the horizon or a light in the background before we undock.

CRO Okay - does it seem to be holding pretty good.

HOU Carnarvon from Flight.

CRO Go ahead.

HOU You can tell them not to acknowledge - we want
to pass on that he may see some extra pro-
pellant usage out of the Gemini because of the
control situation.

CRO Okay.

CRO Is that because of this two and four circuit
break.

HOU That's right.

CRO Okay.

CRO Gemini 12, this is Carnarvon, no need to
acknowledge this, but for your information,
you may see some extra propellant usage from
the Gemini because of the control situation
where upside down with those circuit breakers
open on two and four.

HOU No, they are closed, the circuit breakers are
closed.

CRO With them closed.

S/C Roger - we are going to leave them closed as
per instructions.

HOU That's right.

CRO Okay.

S/C It will only be a minute to wait now until
 we get a light on this.

CRO Okay.

HOU Carnarvon, Flight.

CRO Okay.

HOU Gemini OBC please.

CRO Okay

CRO We've got LOS Gemini.

And this is Mission Control Houston we have had loss of signal at the Carnarvon, Australia station. At LOS the Gemini and Agena were still on docking configuration and both spacecraft all systems were GO. The crew were holding a verticle attitude, still docked. The Agena pointing down toward the center of the Earth. They were waiting for a lighted horizon before actually undocking and beginning the Tether exercise and in an attempt to establish the gravity gradient. We will come back up again at the Canton Island voice remoting station and continue on through Hawaii and the next stateside pass. At 47 hours, 22 minutes and 35 seconds after liftoff, this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston, we're at 47 hours 33 minutes and 55 seconds after liftoff coming up now over the Canton Island voice remoting station. Canton does have acquisition of the spacecraft. We'll stand by for Pete Conrad to put in a call to the crew and see if, in fact, they have undocked and have begun the tether exercise. Still nothing but carrier noise. This Canton Island pass will continue on through the Hawaii pass. Let's join the conversation.

CONRAD 12 Houston at Canton, standing by.

S/C Roger Houston, 12 here. This is Aldrin what do you want? If you want to have some fun try doing this with two attitude thrusters out.

CONRAD Roger.

S/C I'm at the end of it now.

CONRAD Say again. You're broken up. Slowly please.

S/C We're sure having to do a lot of translation.
The Agena's beautiful, it's just standing there nice and vertical and everything is really swell and nice there was no jerk or nothing, the Agena went along beautiful.

CONRAD Very good.

S/C We simply don't have any spacecraft control.

CONRAD I see.

S/C Even if I try to translate to the (garbled)

CONRAD Roger.

S/C (garbled)

CONRAD Say again. You say your rate command doesn't work?

S/C Rate command is firingit won't stop any thing.

CONRAD 12 Houston, you'll be coming in to Hawaii in about 30 seconds and you'll have better com. They'll be talking to you.

S/C Okay Pete.

HOU Hawaii flight.

HAW Flight Hawaii

HOU Send us a Gemini Alpha, a couple of time during your pass and a couple of Gemini mains.

HAW Roger, will do.

CTN Canton local. I think we've lost contact with the spacecraft.

HOU Say again.

HAW We have initial contact at the present.

HOU Okay, and if he contacts you after you're standing by, after PQI , it is convenience.

CTN Okay, it's local.

HAW We're still pretty ragged at the present.

Gemini 12 Hawaii standing by.

S/C Roger, Hawaii, this is 12. We aren't having too much success in maintaining position with the Agena.

HAW Roger, understand.

HAW At your convenience we'd like to get a PQI from you.

S/C Roger, that's 35 percent.

HAW Roger, thank you.

S/C Hawaii here's the situation again in case you did not get it, at Canton. The tether deployment was fine we let it come out and the velcro hung it up a little bit, thrusters managed to get it unstuck. It hung up just slightly at the 50 foot marker and we got it undone. We'd be in great shape right now if we had a control system. The Agena is fine, the tether is out, we are hardly moving, except that we can't control attitude. Everytime I try to control translation we change our attitude and we have no good control over it.

HAW Roger.

HOU Hawaii from flight.

HAW Go flight.

HOU Has he tried any other control modes?

HAW Have you tried any other control modes?

S/C Roger, we have tried rate command, rate command fires continuously but will not stop the roll.

HAW Rog.

S/C We switched back and forth the roll (garbled) and that helps.

HAW He's in direct right now.

HOU He's in direct right now?

HAW Affirmed.

HOU Okay. And if that doesn't work you might ask him if he wants to try pulse?

HAW Flight suggests trying pulse.

S/C Trying pulse? We've tried pulse.

HAW Roger.

S/C We've tried pulse, we've tried direct, we've tried recommand. We just don't have any roll control that's what's wrong Hawaii. We have tried to get roll by pitching yaw but we just can't do it.

HAW Roger.

HOU Hawaii from flight.

HAW Yeah, go flight.

S/C We're thinking about just letting it go and hoping that maybe whatever we've got in will hold it.

HAW Okay, that's what flight was just suggesting here.

S/C The Agena is in perfect shape, it's just beautiful and just perpendicular and if we only had a control system I'm sure we could do this thing much better than even in the simulator.

HOU Yeah, we're showing you're hanging in there in good ^{feels} contention. Ask him how he / about just letting the roll go.

HAW Yeah, we're talking right now.....(faded out)

HOU Hawaii?

HAW Go flight.

HOU Ask him how he feels about just letting the roll go?

HOU And not trying to control it.

HAW Rog. That's what he was saying wasn't it?

HOU Not exactly. Ask him that question and see how he responds.

HAW Okay we're picking up some now.

Okay, what we would like to have you do if you are willing, is to just let the roll go and see if it will damp out after a while here.

HOU He isn't going to damp out Hawaii, he's just going to let the roll go and just worrying about pitching....

S/C Roger. We've lost sight of the Agena. As long as the tether doesn't wrap around it we'll do it.

HAW Okay. Flight doesn't think you will really damp out in roll.

S/C Well, we've stayed well above him now for quite a while. We are out in front of him just a little bit.

HOU Hawaii from flight.

S/C Yeah, we're also getting a little low on ACS gas pressure.

HOU HAWAII from flight.

HAW Go flight.

HOU What we want to tell them is try to control it in pitch and yaw as best he can.

S/C10 to 15 feet maybe ten feet of slack

HOU Try to control it as...(interrupted)

S/C Looks like Hawaii is pretty today

END OF TAPE

Lovell Looks like Hawaii is pretty today.

Haw It sure is. Try to control in pitch and yaw and just let the roll part of it go if you can do that ok.

Aldrin Well, when we put it in pitch and yaw all we get is roll.

Haw Ok. we show that the Agenaon the tether that way.

HOU FLT Hawaii from Flight.

Haw Go Flight.

HOU FLT Suggest flight control mode 1 on the Agena, 451 and 460 if they can get.

HAW We'd like to have you go to Flight Control Mode 1 on the Agena if you could, and include 451 and 460 in an attempt to save some of the control gas, its getting mighty low.

Lovell Roger, 451 and 460.

Haw 451 and 460 - got a map on both of them.

HOU FLT Rog, thanks. Can you confirm that on the ground Hawaii? Flight Control 1?

Haw That's affirm, Flight.

HOU FLT Ok.

Aldrin We are still and don't seem to be getting too much further ahead, we may possible have to go to (garbled)

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Haw roll rate
(garbled)/ 3.89 feet here on the ground. By the
way it is a decrease, too, Flight, since our
acquisition.

HOU FLT ..say again

Haw We'll have LOS in about a minute here.

 That is a decrease since our acquisition.

HOU FLT Ok, in roll rate.

Haw Affirm. Pitch is staying in there pretty good and yaw fluctuates back and forth, however, he doesn't look like he's getting too bad out of yaw.

Hawaii has had LOS out of both vehicles.

And this is Gemini Control. We've had loss of signal from the Hawaii Island Tracking station. During the conversation between Hawaii and Gemini 12 it was revealed that they are having a small amount of difficulty in maintaining Gemini attitude, however, the Agena target vehicle is hanging in quite well in a vertical position, looking very beautifully, as the crew mentioned. Their propellant quantity remaining at the present time on the Oams fuel of Gemini 12 is 35%. Part of the attitude control problem has to do with the two thrusters being out and they are getting a certain amount of cross-coupling when they attempt to take out any roll motions. We are coming up on a stateside pass now, should be acquiring in California at the present time. We'll stand by to join the conversation through the stateside and Eastern Test Range pass.

Still standing by for the stateside pass. As yet...now he's putting in a call, let's join it.

CAP COM Gemini 12, Houston at California.

Lovell Roger, Houston, 12.

CAP COM How does it look now.

Lovell Say again?

CAP COM How does it look now?

Lovell We are still just a little bit ahead and let me give you the direction of the travel, a little bit to the right. We've stayed ahead for quite some while, and I don't know, I think we might get ...

Cap Com Roger

Lovell We've just about stopped doing anything, just about anything we do all goes to....so we are just staying here to see what happens. We have a loose tether between the Agena and the spacecraft.

CAP COM Ok.

12, Houston, about how many times have you hit the end of the tether?

Aldrin Three - four times.

CAP COM So it looks like you're just sort of bouncing off it lightly.

Lovell That's right.

CAP COM It sound s to us down here that you are either rotating very slightly or you are captured and

and it looks to us like you would be alright,
how do you feel about going into night that way
and not trying to station keep?

Lovell That's a good decision, I think.

CAP COM Ok. During the pass over Texas and the Cape
acquisition we'll be sending you some DPS loads,
and we want to do this just to check out computer,
and we'll call them while we check them.

Lovell Roger.

CAP COM And if its alright, I'll give you a call before
we do it and you can go to prelaunch for us so
we can look at it.

Lovell Roger.

HOU Guaymas remote. California local.

GYM Guaymas remote.

CAL California local.

Lovell Houston, 12 here.

CAP COM Go ahead.

Lovell My only concern, Houston, is the fact that we
have a very loose tether and its snaking around...
I'm concerned that it might get wrapped around
some of our antennas on the side of the spacecraft,
along the end.

CAP COM Thank you, copy.

Aldrin We are about lying abreast with him in the direction
of motion now, we've been ahead of him up until now.
He's off to the right.

CAP COM How many feet off to the right?

Aldrin Well, it might be, I'll measure it in degrees,
about 40 - 45 degrees.

CAP COM Roger, just keep watching, you've got quite a ways
to go before night.

Lovell Yes, I think the big thing is, can we keep below
the horizon.

CAP COM Roger.

Aldrin The tether's kind of wrapped around him now.

CAP COM Copy

END OF TAPE

Houston Texas remote, Guaymas local
Texas remote, Guaymas local
CAPCOM 12, Houston. Would you put your computer to pre-launch please.
Lovell Roger, it is on pre-launch.
CAP COM 12, Houston. Stand by, we are sending you a load.
Lovell We are going right over you now Houston.
CAP COM Houston, copy.
Lovell Almost. If this thing is leaning just right, we might even get a picture of the Agena and Houston at the same time.
CAP COM Outstanding.
Lovell Don't keep your fingers crossed.
Aldrin Would you settle for Corpus Christi?
CAP COM Affirmative
Lovell Smile down there
CAP COM Roger we are smiling.
Lovell I think I got several good shots of the Agena with Houston in the background.
CAP COM Very good. 12, Houston, would you please switch the computer to catchup now. 12, Houston, would you switch to catchup, the load was good.
Lovell Roger, we are in catchup. Thank you.
CAP COM Roger, stand by for a TR. Mark
Lovell Got it. Houston, it appears that we are slowly dropping now and the Agena is slowly rising up to the horizon. I believe.

CAP COM Roger, how much slack have you got in the tether?

Lovell Not too much, we get pulled occasionally but that is about it.

CAP COM If it keeps bouncing off the end of it, I think you are safe in going through the night as long as you don't get too much slack. How do you feel about that?

Lovell Well, there is slack, Houston, and the slack goes back to the back end of the spacecraft. If she stayed taut, we would be fine.

CAP COM What is the rate that you are hitting the end of the tether at, once every two or three minutes, or less than that or more.

Lovell Oh we are going real taut, but it is coming fairly close. I think that there is probably some elasticity. We lucked out I think somehow.

CAP COM You are saying, that when you get slack in it though, you are getting some slack that looks like it is getting underneath the spacecraft. You can't see the tether, is that what you are saying.

Aldrin That is right. For instance, right now we can't see the tether or the Agena. It is down below us someplace. But it is obviously pretty close to taut because, for example, right now it is wrapping around that spacing thing that I put on. It looks pretty close to taut right now.

CAP COM OK, that sound familiar.

S/C And, yes, the Agena, it is a good ways away
from the horizon.

HOU Roger.

S/C But there is no more than three or four pounds
in that tether when she hits the end. It is
very, very gentle. I would say we just passed
the taut tether.

HOU Roger.

Well, it sounds like it is cycling and that is good.

S/C We are still on the right side of him. We have
gotten a little closer now, to his line of motion.
To the orbit plane. We are mostly behind him now
and I think the way to really tell is to how far
down the horizon we go when we get to maximum or
behind him.

HOU Roger. We concur.

ANT LOS Antigua.

HOU 12, Houston how much of the tether can you see
when it is over the nose?

S/C Well, for instance, right now I can see the whole
thing because I can see the Agena, but at times
we can't see anything. Just the red wire that
goes right down around the nose, but it is below it.

HOU Okay, can you give us some idea of what your attitude
excursions are with respect to the tether then? In
pitch, say, like 60 degrees, 45 degrees, how much are
you pitching with respect to the tether?

S/C 90 HOU Do you think it is going all the way to the nose?

S/C About 40 degrees.

HOU Okay, one says 90 and one says 40, you guys discuss this and let us know.

S/C Okay, I think we agree. One was with respect to the tether and the other was with respect to the local vertical.

HOU Okay.

S/C With respect to the local vertical we're pitched up 110 degrees.

HOU Okay, and the Agena is down below you.

S/C That's right and we're looking at the sky.

HOU Okay, are you still pitching up or are you pitching down?

S/C We're passing through the horizontal plane, right now.

HOU Pitching back down.

S/C Rog.

HOU Okay

S/C And we're almost due aft or straight behind the Agena

HOU Okay, so with respect to the Agena you're almost on the horizon with him too, huh?

S/C No, not quite. He hasn't reached the telemetry area yet.....

END OF TAPE

HOU Agena you are almost on the horizon with him
too, huh.

S/C No not quite. He has not quite reached the
rim of the earth. And he may not get there.

HOU Okay, how about letting me know when you think
you are beginning to go back up with respect to
- in other words traveling forward with respect
to the Agena.

S/C Okay, we are both looking for the same thing.

HOU Yes, I think if you do that, don't you think
you are beginning to be captured.

S/C Yes, think so.

HOU You have about 13 more minutes to sun set.

S/C Roger.

GTI LOS Turk.

HOU Okay, correct that, you have about 9 minutes left.

S/C ..with all the .. I used, the Agena is still below.
However, now we have quite a big loop in the tether.
I'd say we are about 60 feet away from it right now.

HOU Opening or closing.
12, Houston. We have got about 3 minutes and
30 seconds to Antigua LOS and we will have you
again at Ascension. 12, Houston do you have

HOU radar range. Are you locked up on..

S/C Radar is on, however, we are not getting anything.

HOU Okay, we copied on the ground here some thruster firing. You firing your maneuver thrusters.

S/C Just fired it.

HOU Say again.

S/C Just fired it briefly.

HOU Okay.

S/C ..attitude, trying to see if we can station keep at night.

HOU Okay. 12, Houston. What do you think. Do you think you are all right to go into night? Either way. 12, Houston. Are you satisfied you can station keep?

S/C We will give it a try.

HOU Okay. Very good. And we have about 1 minute until LOS Antigua. We will see you at Ascension at 48 16 18.

ANT LOS Antigua.

And we have had loss of signal at the Antigua station of the Eastern Test Range. During that state side pass, there was a considerable amount of discussion about whether or not to attempt to station keep through this upcoming night pass or stay on the tether and see whether eventually they might be captured in the gravity gradient mode. The

tether occasionally would taut between the spacecraft and the Agena. The two spacecraft have just begun Gemini 12 has just begun its 31st revolution. This is the 32nd revolution for Agena. We will come up again at the Ascension Island voice remoting station, in some 4 minutes from now. At 48 hours 12 minutes and 9 seconds after lift-off, this is Mission Control Houston.

END OF TAPE

This is Mission Control in Houston. We have had acquisition of signal of Gemini 12 through the Ascension Island voice remoting station. We are standing by for Pete Conrad to put in a call to the crew through the Ascension station. Here he goes, let's listen.

HOU Gemini 12, Gemini 12 - Houston at Ascension - over.

S/C 12 - ... we finally got back just over ..
..... turned it back on again.

HOU 12, this is Houston. We are still a little low yet and I couldn't read you - say it again slowly.

S/C We are in the light now and we just started to separate. We are coming up for ... 0.
We expect sunrise at about 30 degrees silhouette.

HOU Roger

S/C These lights keep flashing because we have ...
we haven't actually started at all because of the Agena

HOU Uh - 12 - Roger.

HOU Just pass on to you, if you want to maneuver you might remember that if you are gonna maneuver in pitch, but your logic switch to yaw and vice versa. It might help a little bit... and if you have a few moments between Ascension and Tananarive then you can look at your water gun, we would like to get the count off it, if you can't, forget it.

S/C 1507

HOU Understand 1506

S/C 1507 incidentally, I think this is leaking a little bit.

HOU 12, the com is very bad, we are not reading you too well, we will get you at Tananarive in a little while.

S/C Roger

HOU Yea, the "Roger" came through loud and clear, say it again now, maybe you are getting pretty high over the station, maybe we can read you.

S/C The water gun is reading about 1507, might be a little higher than that now. I think it might be leaking a little bit, I'll be watching it.

HOU Roger - copy.

S/C Alright, on that water tank, we haven't been keeping telemetry .. that's probably why it has been acting up.

HOU Okay, Roger - copy.

S/C Gemini 12

HOU Go ahead 12.

S/C The Agena looks like it is fairly nearly taught all the time now and we've just about to pass stateover. We are thinking of maybe letting the Gemini pass as we go over.

HOU Roger - I didn't quite copy all that.

HOU Okay, we got that. The other thing is we have been looking at your OAMS propellant and you have plenty. That's no problem right now.

S/C Roger.

HOU 12, Houston - one minute to LOS at Ascension.

S/C Roger - garble ... that same attitude.

HOU Roger.

... LOS

We have had loss of signal at the Ascension Island voice re-moting station. The communications during this pass even though it was a high elevation angle pass and rather fuzzie.

We are coming up over Tananarive in approximately seven minutes.

We will come back up at that time, hopefully the communications will be a little more clear. At 48 hours, 25 minutes and 47 seconds after liftoff this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston. Gemini 12 should be acquired by the Tananarive voice remoting station. We're standing by for any conversation. Let's listen in right now.

HOU Gemini 12, Houston standing by at Tananarive.

SC Roger, Gemini 12 here.

HOU 12, Houston. How is it looking now?

SC (garble)

HOU Roger.

12, Houston. The ACS is still on in the Agena isn't it?

SC Roger it is. It is about horizontal with us right now. What we are going to do is put in a very small upthrust and then we'll try and kill our translation, as we pass over directly above it if we do. The tether is tightly taut now and I think as long as we can keep it taut we might be able to kill our rates as we pass straight over.

HOU Roger. Copy.

HOU 12, Houston. One minute to LOS at Tananarive. Carnarvon 48:48:02.

TAN Tananarive LOS

And we've had loss of signal at the Tananarive voice remoting station. We'll come back up at the Carnarvon pass which will be in about 8 minutes. At 48 hours 40 minutes and 37 seconds after liftoff this is Mission Control Houston.
END OF TAPE

This is Mission Control Houston. Let's join the conversation now in progress between the Carnarvon, Australia tracking station and Gemini 12.

S/C ...control mode do you show the Agena in now and how much gas is left?

CRO Okay, in FC-1.

HOU We show 5 pounds gas Carnarvon.

CRO Okay, about 5 pounds of gas.

Has there been much thruster activity in the Agena.

HOU Just very little. In fact, it is practically nil.

CRO What was your last comment Flight?

HOU Say again?

CRO What was your last comment? I though I heard you say something.

HOU I just wanted you - I didn't think you copied his first transmission. He asked about the Agena.

CRO Oh yes, I copied. I was just checking on all that. We are showing yaw right, yaw left. Yes, he is maneuver quite a bit.

HOU Say again.

CRO He is doing quite a bit of maneuvering right now.

HOU Okay. We need an Agena contingency India.

CRO Roger.

CRO Okay 12, you can turn your encoder bac on.

S/C Okay.

HOU Does he think he has it set up yet? Carnarvon,
ask him if he thinks he is close to set up.

CRO 12, this is Carnarvon. How close to setting up
the Agena do you think you have it.

S/C Well, we are trying to get back into position
now and I think we may have a slightly better
crack at this time than we had before. Rates
seem to be nulled down a bit better.

CRO Okay.

S/C We will do what we can.

CRO Do you want to make any comment about the
purge, Flight?

HOU I am think about that. It sounds like he has
the rates nulled and is ready to get started
into it.

CRO Right.

HOU I think I am going to let it go.

CRO Okay. The last time he was talking to me it
sounded like he has a typewriter up there or
something.

HOU That might have been our little printer over here.

CRO Oh.

HOU Carnarvon Com Flight.

CRO Go ahead.

HOU Are you seeing any thruster activity on the
 spacecraft.

CRO That is affirmative. Yaw right.

HOU Is it very much or would you say pretty small.

CRO Pretty small.

HOU Okay.

CRO He just gave about 3 pulses on, yaw right.

HOU Okay, what control mode, pulse?

CRO That is affirmative.

HOU Okay.

CRO There is a little more yaw right.

HOU Carnarvon Com Flight.

: Carnarvon Com Flight.

 Carnarvon Com Flight.

 Carnarvon Com Flight. Carnarvon Cap Com, Flight.

 Carnarvon Cap Com Flight.

HOU Carnarvon, this is Flight. If you read me,
 send us an Agena LOS main.

This is Mission Control Houston again. Apparently we are having a little difficulty with the communication lines in the last portion of this pass, over Carnarvon. But we passed the time what should

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have been loss of signal at Carnarvon. We will come back up at the Hawaii pass, which will be in approximately 16 minutes at 48 hours 57 minutes and 36 seconds after lift-off, this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston, the spacecraft Gemini 12 attached to the Agena Target Vehicle by the tether is coming up now over the Hawaii tracking station. They're beginning to get sort of ragged electronic contact with the spacecraft, as it comes farther over the hill. We'll have a pass here of about 8 minutes and 31 seconds over Hawaii. We'll standby for the conversation between the Spacecraft Communicator, Keith Kundell and Gemini 12. The Spacecraft Communicator reports that everything is a lot more stable than it was the last time around. The control system on Gemini is turned off at this time. Let's listen in.

HAW 12, Hawaii standing by.

SC Roger Hawaii we're still giving this tethered Agena a try.

HAW Roger and it looks pretty stable from here.

SC Roger, we haven't dropped it in quite awhile and looks like we're in pretty good shape. We're just about to the 10 feet south and maybe 20 feet ahead of the direction of orbit travel. Good tight tether now.

HAW Roger looks like you still have a very slow roll rate and that is very gradual.

SC Is that the spacecraft you read.

HAW Affirm.

SC Now while our attitudes does have certain excursions to it, we're about 45 degrees pitch aft now.

SC That doesn't seem to be to much it'll bother
 them.

HAW Roger, very good.

HOU Hawaii Flight

HAW Go Flight

HOU I copy him the Agena 10 feet down below him and
 20 feet to which side?

HAW Affirm

HOU Which side of the Agena?

 Is he to the right or the left of it?

HAW Are you to the right or the left of the Agena?

HOU He's to the left of the Agena?

SC We're just about to cross right now, as far
 north south with respect to the orbit plane.

 We're crossing now and we're maybe 10 feet
 ahead.

SC Yes, 10 feet ahead.

SC Right.

SC Going just a little bit north now. All right
 I'll make that (garble)

HAW We have an Agena clock reset load to send in

 could you give us encoder off please?

SC Roger, encoder off, (garble) will not lock on

 and we're not able to get map lights right

 now. We're not pointed directly at it. I

 tried to switch to spiral or dipole and was

unable to get any map lights.

HAW Okay.

SC Which antenna do you show we're on now?

HAW At the present time you're on the spiral.

HAW At the present time you're on the spiral antenna.

HOU Hawaii, Flight, a memory compare and SPC load?

HAW Okay.

We're rechecking it.

HOU Is the spacecraft computer still up Hawaii?

HAW That is affirm Flight.

HOU Okay, send OBC's Hawaii, Agena - India and echo contingency.

HAW India and echo, roger.

HOU Roger, and an OBC.

HAW Roger

HAW Okay and since we've had acquisition it's roughly 4 minutes now, he's gone through it looks about like a 50 degrees in roll and pitch and yaw are almost solid.

HOU Ask him if he thinks its setting up properly in the gradient now?

HAW 12, Hawaii. Do you think you're setting up in the gradient at the present?

SC It sure looks like it. We're - the docking bar is lined right up with the dipole, almost

straight above it and the tether is taut.

HAW

Okay, mighty fine.

Since we've had acquisition on you you look like you've rolled about roughly 60 degrees, that's been over about a five minute period now.

SC

That's not the attitude we're worried about it's more the (garbled)

I think we might want to stay with Agena in attitude control a little bit longer and then maybe near the end cut her off.

HAW

Okay.

Flight go ahead and try to update him right now.

HOU

Roger.

Think maybe we ought to try sending a command, something that we have a function that we can verify that we're actually getting into the thing.

HOU

Hawaii from Flight.

HAW

Go Flight.

HOU

They want to use a command to check it, they could use a purge light.

HAW

Okay, we seem to be having trouble getting into it too. I think maybe we ought to check first and then let him try it.

HOU

Okay. You've got a memory compare on your clock

load didn't you?

HAW Unfortunately that was may mistake on that
Flight, we didn't.

HOU Okay.

HAW We're showing we're not getting into memory
either.

HOU Okay, do you want to try it again?

HAW Yes, we've resent it again and we still get
negative on the memory compare.

HOU And the encoder is off right.

HAW Affirm.

Oh, it did go in the second time he said. It
shows up now on the memory readout that it is
in and in correct.

HOU Okay.

You sent SPC enable then.

And give him back his encoder as soon as you
can.

HAW Roger.

Okay, we got that in okay.

HOU Thank you.

HAW Let's see, 12 you can turn your encoder back
on. We'll have LOS in about one minute.

If you'd like to change antennas, we'll
check and see if you get it in okay.

SC What do the Agena people recommend for
getting it locked in?

HAW What do you recommend on it?

HOU For what?

HAW For their check.

SC Okay, I'm on the spiral now.

HAW Yes, that is affirm.

SC Okay, I'll send 260, see if it switches.

HAW That is affirm, we agree it did switch.

SC Okay, I'm not getting a map light here.

HAW Okay, affirm it is working all right.

SC Check and see with them, the Agena people in
Houston which antenna would be best?

HAW Did you copy that last one Flight?

HOU Affirmative.

HAW Oh, one little goof here. I didn't get TX in
so the burn will be coming out with the TM
on it.

HOU Okay

This is Mission Control Houston. Apparently we have had loss
of signal at Hawaii. Coming up on the Stateside pass here,
should be acquiring by the California station momentarily.
Let's listen in now.

HOU Gemini 12, Houston through California.

S/C Go ahead Houston.

HOU Roger, you are getting extremely low on attitude gas in the Agena and if you think you are stable, you still have some daylight any time you are ready, you can go ahead and shut the ACS off.

S/C Houston, the best indication we have really is capture or not is the Agena. If it's that low I guess we will have no choice.

HOU Standby a minute.

END OF TAPE

HOU 12, Houston, go ahead and look at it as long as you want, I just wanted to advise you about the attitude gas and whenever you are satisfied, that's up to you

S/C Okay, Houston, we understand about the attitude gas. Just what do you plan on doing, this tether exercise takes a long time. We are in that region now where we can stay with gases a long period by slowly going into the spin like we did I was afraid to attempt. We are in good position now. We could turn off the gas and just let it go, and I would suggest no matter what it does that we go through the night period perhaps in this manner. We won't touch the controls. So that if we are not captured and we go into a spin we will come out the next day in that spin.

HOU Roger, if you are satisfied, go ahead then. I gather from what you are saying, you have a pretty taught tether all the time now.

S/C That's right, it's a taught tether. There is not much force in there at all, however, we are just merely going along with it. Although we were in the same position the last time and we slo-w-l-y got into a horizontal position, and it might be the same this time.

HOU Okay, whenever you are ready you can give her
 a go.

S/C We are not getting map lights so you will have
 to confirm whether the ACS is ON.

HOU Roger, you will be over Texas in just a couple
 of minutes so we can look at it then. You
 can always send your cone lights or aft lights
 or something like that if you want to assure
 yourself that you're getting in.

S/C It's kinda nice and pretty up here.

HOU I'm talking about when you get in the night
 side if you're -

S/C Nice recovery.

S/C We're talking about attitude gas.

HOU Whose on first.

... Guaymas remote - California local.

... Guaymas remote - California local.

GYM Guaymas remote.

HOU 12, Houston, we have you .. we have Agena
 Telemetry now at Texas if you want to try
 and turn it off.

S/C Roger, we did turn it off.

HOU 12, Houston, we show it off on the ground.
You getting in alright.

S/C Roger.

S/C Houston, 12.

HOU Go ahead.

S/C The tether is essentially taught now and to
give you some idea of force of the tether,
the natural bend of the wire when it made
the loop, is still bent about 70 degrees.
So, you can imagine how small the forces
are in that tether.

HOU Roger - copy.

HOU Texas remote - Guaymas local.

TEX Texas remote.

GYM Local.

END OF TAPE

This is Mission Control Houston, we're still standing by for any further conversation during this stateside pass. Spacecraft just beginning it's 31st revolution. It is now over the Carribean ocean. And will be passing out of the Antigua station acquisition range within 3 or 4 minutes. We'll continue to monitor the air/ground for any conversation.

HOU 12 Houston How does everything look now?

S/C Roger, it appears as though its pointed right toward us and if anything, it looks as if it is moving away from the horizon. Looks like we are in pretty good shape now.

HOU Very good. Very good.

S/C We'll just hold on to this thing through out the main period.

HOU Okay. 12 Houston. On the next rev over Texas I'll pass you your update for your SEP maneuver and it will be with the firing thrusters.

S/C Okay. Matter of interest, the docking light is a good device to illuminate the tether with at night, it works out very nicely.

HOU Yeah. Roger. We used it on ours. We've been watching you here on the ground and it sort of looks like you are just oscillating there in sort of a cone I guess.

S/C It's kind of hard to tell just looking at attitude.

GTI LOS Turk

HOU 12 Houston, we've got about 2 minutes to LOS Antigua

and see you over ascension.

S/C

Roger Houston.

HOU

12 Houston. Did you get a chance to eat yet?

END OF TAPE

ANT LOS Antigua.

This is Mission Control Houston. We have just completed one of the quietest state side passes of this mission. Apparently the tether exercise is going along quite well and tend to be near what may be gravity gradient mode. We are coming up over the Ascension Island voice remoting station where communications haven't been too good this mission and there will be fairly low elevation angles so they could be worse this time. We will come up at that time in approximately 6 minutes at 49 hours 46 minutes and 25 seconds after lift-off, this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston. Spacecraft Gemini XII is now over the Ascension Island tracking station and let's join the conversation between Pete Conrad and the crew of Gemini XII.

CONRADsection 2, then section 1, hydrogen normal and oxygen in a normal purge. Two minutes, over.

S/C Roger, normal fuel cells purge two then one, is that correct?

HOU That's correct. Do it as soon as you come out in daylight And you are satisfied you can watch it and see what happens to your rates and so forth when you purge.

S/C (garbled)and we'll have a.....and see what that does.

HOU Roger.

This is Mission Control Houston we've had only a brief exchange during this pass over the Ascension Island voice remoting station between spacecraft communicator Pete Conrad here in Mission Control and the crew of Gemini XII. Mainly ^{concerned} instructions for doing the fuel cell purge after they came out in to daylight and the main purpose would be to observe any rates that might be set up during the actual purge of the fuel cell hydrogen and oxygen system. We'll continue to stand by during this pass for any possible conversation. It is highly unlikely there will be and then we'll come up again for....let's join the conversation.

HOU Hou...Gemini XII Houston. One minute to LOS
 Ascension and see you Tananarive 50:08.

S/C Roger.
 Ascension LOS

And we have had loss of signal at the Ascension Island voice remoting station and in 8 minutes we are due to be acquired at the Tananarive voice remoting station. We'll come back up at that time. At 50 hours and 11 seconds after liftoff, this is Mission Control in Houston.

END OF TAPE

13
This Mission Control Houston. We're at 50 hours 8 minutes and 46 seconds after liftoff. Over the Tannanarive voice remoting station let's listen in for any conversation between the spacecraft communicator Conrad and the crew. Let's join it.....

HOU Gemini XII Houston through Tananarive, over.

Gemini XII, Gemini XII, Houston through Tananarive

S/C Roger, Houston this is XII.

HOU Roger, a couple of things. Have you turned your computer on, over.

S/C Both computers are on.

HOU Okay. The other thing is have you been moving around in the cockpit at all, we'd like to know if your movements in the cockpit tend to upset the combination at all.

S/C We can't tell just now. It's still dark. I'll let you know in the light time. We did make a urine dump here to see what it would do and we didn't get any results, we'll find out.

HOU Okay, very good and when you do get out in the daylight and after the fuel cell purge if you would make some deliberate movements in the cockpit to observe we would appreciate that and your comments.

S/C Okay. We will. We've been moving in the cockpit, stowing things. Turned the Agena control system off, occasionally we'll get a little....in the tether (garbled)

and then goes slack a little bit.

HOU Roger, very good. Where are you in relation to the horizon now. Are you still pointed down pretty good?

S/C As far as we know, however, it's still dark here and we put the lights on theand we'll have to find out where we are a little bit later.

HOU Okay.

S/C You want us to leave the computer on for telemetry don't you on this.

HOU No. We would like the computer off now if you're not using it so that you will save electrical power.

S/C Houston, this is 12.

HOU Go ahead.

S/C Roger, we reported spacecraft motions through the computer and do you want us to leave it on to records thedegrees.

HOU That's negative, we want the computer off, please.
We want the computer off, please.

S/C Roger.

HOU Thank you.

S/C Houston, would you say again which sections you want purged first.

HOU Roger, purge section 2 first.

S/C Roger, normal 2 minute 30 seconds to purge.

HOU That's affirmative.

HOU Gemini 12 Houston. One minute to LOS Tananarive.

S/C Roger, Houston.

TAN Tananarive LOS

And this is Mission Control Houston, we've had loss of signal over the Tananarive voice remoting station. A fairly noisy pass, a lot of background noise, but some conversation between Mission Control here in Houston and the crew of Gemini XII. In approximately 17 minutes we'll be coming up on the first pass over the tracking ship Coastal Sentry, just south of Japan. We'll come back up at that time with that pass at 50 hours 16 minutes and 49 seconds after liftoff this is Mission Control Houston.

END OF TAPE

This is Mission Control at Houston at 50 hours, 33 minutes and 14 seconds after liftoff. We have had ac-ach contact over the tracking ship Coastal Sentry of Gemini 12. We are standing by for any conversation that might transpire. This is a fairly low angle elevation pass. All systems are GO. Let's listen in.

HOU Roger.

CSQ Gemini 12, CSQ

S/C Go ahead CSQ

CSQ Roger, how did the purge go.

S/C Purge was go. Well, I think we are still captured ... garble ...

HOU Fuel cell purge.

CSQ Roger. We can't have anything else for you, will be standing by.

S/C Roger

S/C Uh, CSQ you might relay to Houston that if it is possible we would like to take the last pictures during the stand up EVA tomorrow.

CSQ Okay. Houston copy.

HOU I did.

HOU CSQ from Flight.

CSQ Go ahead

HOU Tell them that after the separation, or after the end of the tether exercise, we are looking for a maneuver about 25 minutes later, so they will have time to get squared away and do an

align and then be ready for the burn.

CSQ Okay.

CSQ 12, CSQ

S/C Go ahead.

HOU We want to do a burn about 25 minutes after
you terminate the tether exercise and align.

C/S Roger - we were just discussing that CSQ, we
are trying to figure out a way of making the
burn both control .. (fade)

CSQ Rog.

S/C What is the magnitude of the burn, is it ... sec.

HOU That is correct.

CSQ Right

CSQ One minute to LOS Gemini 12.

S/C Roger.

CSQ LOS on Gemini.

And this is Mission Control Houston. We have had loss of signal
on Gemini 12 from the Coastal Sentry tracking ship. We will
come up again during the Hawaii pass which will be in approxi-
mately eleven minutes. At 50 hours, 38 minutes and 17 seconds
after liftoff, this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston we're at 50 hours 49 minutes and 5 seconds after liftoff. We should be acquiring the Hawaii Islands tracking station at any moment, we'll stand by for comments between the Hawaii and the crew of Gemini XII on the progress of the tether exercise. The crew should be in an eat period at this time. Hawaii is scheduled to provide the crew with some planned landing area updates. During the next pass over the states another run of the Beta spectrometer exercise for experiments scheduled to be run. We're standing by for Hawaii here.

Roger, would you please send TX for.....

HOU Hello Hawaii, 12 here. For information we would like to go clean of the Agena prior to darkness in the daylight and also set up for a burn. We are still discussing how to make this burn, we're not to sure how much control we're going to have to make this ome.

HAW Roger, we copy. Did you copy that?

HOU Yes, I copied they were still considering how they were going to do the burn and they weren't sure how well they would be able to do it with the control system.

HAW Roger. They also said they would get clean of the Agena in the daylight.

HOU Okay. Stand by I'll be sure that's what we have. You mean do the burn in daylight? Is that what you mean?

HAW No, they wanted to make...Yeah, yeah, that's right.

HOU Well, you'd better ask them. Do they mean get off the tether or do they mean do the burn?

HAW 12 Hawaii. Do you mean do the burn in daylight and get off rather than get off the tether in daylight.

S/C No. We want to get off the tether in daylight, of course.

HOU Yeah, that's fine, and then we'll do the burn about 25 minutes later in daylight.

HAW Okay, flight says we'll do the burn about 25 minutes later in daylight.

S/C Roger, I think it would be much better to do the burn in daylight. We're going to have to determine just how much control we have and how long, how much it takes to align the platform.

HAW Okay.

HOU Hawaii, will you send a TX for Texas for LOS, 511100.

HAW 511100.

HOU Affirmative.

S/C Hawaii, 12.

HAW 12, Hawaii.

S/C Roger, unless you want us to continue gravity gradient we can get off the tether any time you want us to.

HAW Okay, they're looking at that real close right now. We'll have something for you shortly.

S/C Okay.

Sounds like they want to get off right now. Do

you want us to go ahead.

HOU Negative standby.

HAW Hawaii from flight

HAW Yeah, flight.

HOU We would like them to continue the gradient through the rest of this day pass and through the upcoming day pass and then separate at the next sunrise.

HAW They would like for you to continue this gradient exercise through the rest of this day pass night time and then separate upcoming sunrise.

S/C Okay, understand we'll continue the gradient through the next night pass and separate at sunrise.

HAW Roger, that's affirm.

S/C understand.

HAW 12 Hawaii, we'll have LOS in a minute.

S/C Roger, Hawaii.

HOU Hawaii has LOS

This is Mission Control Houston. We've had loss of signal at the Hawaii station. We're coming up now on a stateside pass that will carry the spacecraft down over the Mexico, Central America and South America with a fairly brief time over part of the eastern test range, Guaymas and the California station. Should be acquiring at California in approximately ten seconds. We'll stand by for spacecraft communicator Conrads conversation with the crew. Let's listen in.

HOU Gemini 12 Houston to California, over.

CAL Roger, 12.

HOU I got the up date your PIAs anytime you're ready to

copy.

S/C

Okay.

HOU

Okay. Area 34-3A; GETRC 532029 RET 400K 2107;
RETRB 2635; the bank angles are roll left 80
roll right 100, the weather is good in the bank'
angles and the bank angles are good in all follow-
ing areas. There is a separation maneuver re-
quired for 34-3A, no separation maneuvers for the
rest of them. Area 35-3 Bravo GETRC 545601; RET
400 K 21 + 05, RETRB 26 + 53, area 36 - 3A, GETRC
563201, RET 400K 20 + 35; RETRB 25 + 58; area
37 charlie charlie, GETRZ 580705; RET 400 K 19 + 55
RETRB 25 + 04; area 38 Alpha charlie 590142, RET 400K
20 + 54 , RETRB 26 + 40 area 39 Alpha charlie, GETRC
60 38 01, RET 400K 21 + 17, RETRB 27 + 05, area 40-2
Alpha, GETRC 621152, RET 400K 21 + 20, RETRB 26 + 42
Do you copy?

S/C

Roger, I got all of them except the first area and
GETRC and RET 400K.

HOU

Roger, area 34 - 3 Alpha, 53 20 29, RET 400K 21 + 07
RETRB 26 + 35.

S/C

This is Gemini 12, you faded out at the end but I
have it all, thank you.

HOU

Okay, I've got a separation maneuver for you, are you
ready to copy?

S/C

Roger, go ahead.

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HOU

Roger, purpose separation. GETB 5.....

END OF TAPE

S/C Roger, go ahead.

HOU Roger, perfect separation. GETB 52 14 27
Delta V 60, 6.1 excuse me. Six feet per second.
Burn time 8 seconds. Yaw 0, pitch 0. Address 25
00060. Address 26, address 27, all zeros. Thrusters
aft, maneuver posigrade.

HOU Guaymas go remote, California go local.

GYM Guaymas remote.

CAL California local.

HOU 12, Houston, did you copy?

S/C Roger, you faded out right at the end. Separation
maneuver GET burn 521427, Delta V 6.0 duration 8 seconds
yaw 0, pitch 0, address 25 9 say again address 2500060
address 26, 27 zeros, say again after that.

HOU Roger. Thrusters aft, the maneuver is posigrade.

S/C Roger, understand thrusters aft maneuver posigrade.

HOU 12, Houston. We appreciate your control problem and
we are going to see how well you do on your burn and
how you do on getting your platform alignment and
everything and we will talk to you after that about
the rest of it.

S/C Very good. It gives us a little challenge.

HOU Okay, I didn't copy your last. We would like you to

HOU turn your X-eray on Beta with mag and leave it on
through the sleep period, please.

S/C Roger. X-eray on the Beta with mag through the
sleep period.

HOU And what was the last thing you said?

S/C Disregard.

HOU Okay.

HOU Texas go remote, Guaymas go local.

TEX Texas remote. .

GUY Guaymas local.

HOU Okay and after your separation maneuver, we plan
to power you down and get you fed and go to bed.

S/C Very good. Houston, 12. There doesn't seem to
be too much doubt that we are captured. ..two
total amplitudes. Seem to be... a little bit
... total angle ... vertical ... previous one, but
they recovered within about oh, I would say 30 degrees
on horizontal.

HOU Roger. In other words, you are gone about plus
or minus 60 degrees from the vertical.

S/C Yes, looks like it.

HOU Roger, very good. 12, Houston, FEE will look for
your crew status report. You can pass it whenever

HOU you are over his station and you are ready to give
 it. No rush.

S/C Roger.

HOU And 12, Houston. Your sleep period is going to
 run approximately 53 hours to 61 hours.

S/C Roger. Roger, we just passed over Acapulco.

HOU And 12, Houston. After you separate would you
 turn your encoder off.

S/C Will do. Do you have any fix for the radar?

HOU That is negative. 12, Houston. I think we are
 going to change the plan and see if we can't put
 S-51 in for tomorrow morning. And it also looks
 like your separation from the Agena for the last
 time.

S/C Say again please.

HOU Roger, we are going to try for S-51 in tomorrow.

S/C Okay, what is that change address that you want.

HOU Yes, we are going to change the time so you do
 S-51 and the jettison tomorrow.

S/C Okay. You say we are not coming back to the Agena?

HOU It looks that way right now. We would like to see
 how well you do after you get off it. That is the
 main thing.

S/C Okay, I guess you want to check our ... no
 residuals...

HOU That is affirmative. Okay you are going over the
 hill now and this is your last state side pass.
 We will see you in the morning.

S/C Roger.

This is Mission Control Houston again. We have had loss of signal out of the Texas station in the Eastern Test Range. And our next station to be acquired will be a brief pass just over the edge of Ascension Island. However, it is such a low elevation angle, it is highly unlikely any contact will be attempted. We will come up over Tananarive at ground elapsed time of 51 hours 43 minutes 22 seconds. During this state side pass, Pete Conrad passed up to the crew a series of planned landing areas updates. Also a time for jettisoning the tether of ground elapsed time of 51 hours 49 minutes 27 seconds and the separation maneuver of 6 feet per second posigrade at a ground elapsed time of 52 hours 14 minutes and 27 seconds. At 51 hours 12 minutes and 42 seconds after lift-off, this is Mission Control Houston.

END OF TAPE

This is Mission Control Houston at 51 hours, 43 minutes and 25 seconds after liftoff. Coming up over the Tananarive voice remoting station should be acquiring right now. Standing by for Pete Conrad to put in a call. There he goes, let's listen.

HOU Gemini 12, Gemini 12 - Houston through
Tananarive - over.

S/C Houston, this is Gemini 12 through Tananarive
talking.

HOU Roger, I've got a few things for you. As soon
as you get off the ~~weather~~, we would like you
to hold a normal fuel cell purge while you
are aligning the platform and prior to the
SET maneuver. Also, make sure you get the
encoder off as we want to set up the Agena.
And then you can go ahead and eat and sleep
which will be 53 to 61 hours elapsed and
tomorrow morning we are going to schedule
S-51 at 62:45 and your second pass by us
will be 64:20 and we gonna try and schedule
the EVA at 65 hours, so, you think you have
enough time then, on your second pass all
you have to do is snap a couple of pictures.
Over.

S/C Uh, let's think about that for a while.
Meanwhile we will be asking how critical
is the ~~time~~ on this SEP burn Houston. We

want to take our time and if it's not
critical between separation if we burn
a little bit later on.

HOU Well, Roger, I thought 25 minutes would be
enough for you to get off. We could move
it a little bit later I believe.

S/C No, I say, we don't know what it's gonna
take. We just want to know if it's critical
on the time for the burn.

HOU No, it's not critical, if you can make it,
go ahead and make it.

S/C How about burning BEF with the birds flying
separate during telemetry, going away.

HOU That's fine, burn it any way you want and if
you don't burn it on time, if you will give
us the exact time of the burn, that's fine.
Whenever you can burn it, burn it.

Well, what we need is the exact time.

S/C Roger - 12.

HOU Okay, for the rest of tomorrow we will work
out a schedule of D-10, T-2, S-11 and S-29
depending on how good your control system
ability is after you give us a little evaluation
after your SEP burn.

S/C Roger.

HOU Although, if you are awake during your sleep period in the middle of the night for any reason, and you can think of it, a 30 second O₂ purge will help your fuel cells during the night time there. If you aren't awake, no problem, but if you are well give it a 30 second O₂ purge.

S/C Roger - understand. We've been able to get a purge just a little bit ago. Do you want this to be a forward two minute purge.

HOU That is affirmative. We would like to get a full purge on it right after you get off the Agena while you are aligning the platform.

S/C Roger, understand. Also, we have been looking at these Delta P lights for a little while and the only thing we are getting through the circuit breaker is the fact that the Delta P lights are on. We would kinda like to turn them off.

HOU Okay, we concur.

S/C Thank you

HOU 12, Houston, the only way we can see and monitor the Delta P lights on the telemetry is if you leave them on. So, if you could cover them with something we would appreciate it if you would leave the circuit breaker on.

S/C Plug it in. Okay we will do it right.

HOU Okay, the only difference on your burn time Delta T wise with the forward firing thrusters

it will be a 10 second burn vice an 8 second burn.

S/C Roger.

HOU That last purge you did helped the fuel cells considerably, so that's why we want to get another long purge on them.

S/C Roger.

HOU 12, Houston - have you set from the Agena yet.

S/C I am going to now.

HOU You are going to now, is that correct.

S/C Roger - standby.

HOU Okay, we've got about a minute and 45 seconds from LOS.

S/C We are released .. we still got it within ..
Boy, are we released.

HOU Understand you are off the Agena, is that correct.

S/C Roger and the force of rate... is a good one... it looks like a good (fade)

HOU Roger. We get it in rate command.

S/C Say again.

HOU I say, we didn't notice that, we were in rate command when we did it. Of course, ours was working real good.

TAN Tananarive LOS.

This is Mission Control Houston. As you heard during the Tananarive pass the crew jettisoned the tether between the spacecraft and the Agena target vehicle at a ground elapsed time of approximately 51 hours, 51 minutes and 10 seconds. This time may be revised somewhat. Other information passed to the crew was that their sleep period would run from approximately 53 hours ground elapsed time to 61 hours ground elapsed time. Times for tomorrow morning sodium vapor cloud test from the French rocket site in Algeria, the first pass would be 62 hours 45 minutes ground elapsed time and the second pass 64 hours, 20 minutes. The second standup EVA tomorrow will come at about 65 hours. At 51 hours, 53 minutes and 28 seconds after liftoff, this is Mission Control Houston.

END OF TAPE

This is Mission Control at 52 hours 6 minutes and 4 seconds after liftoff. Spacecraft Gemini 12 has just entered the acquisition area of the tracking ship Coastal Sentry. We're standing by for any conversation between spacecraft communicator, Bill Garvin, and the crew of Gemini 12. Garvin is putting in a call now.

CSQ Gemini 12, CSQ

S/C Roger, CSQ

CSQ Roger, we're ready to go ahead and start gyro compassing the Agena.

S/C Don't touch the Agena yet. We don't have much light and we want to get away, we're trying to watch. We trying to align the platform. We have a hard time finding them.

CSQ Give me a call when you are ready

S/C I don't know if we'll get a /^{four} feet per second separation, but we're ready to compass.

CSQ Okay.

S/C We're using maneuver thrusters for yaw control.

CSQ Roger. Flight, CSQ

HOU Go ahead.

CSQ You may have to have to go ahead and gyro compass this thing over Hawaii

HAW Yeah, okay.

Two minutes from LOS

You still have to call me back.

CSQ Okay, Hawaii.

HOU CSQ, flight, would you send us an OBC.

CSQ Okay.

HOU Say again, you're fading in and out, Bill.

CSQ I say, I'd like to remind you to have the Agena send out that time word reset load. We didn't transmit that either.

HOU Okay. We copy.

CSQ We're coming up on LOS, Gemini 12.

S/C (garbled)

HOU Did he say he was going to burn on time?

CSQ That is affirmed. Flight, CSQ.

HOU Go ahead.

CSQ We caught that about the fact that he is utilizing the on control by using the maneuver thrusters.

HOU Yeah, we copied that.

CSQ Okay. We had a LOS on Gemini

This is Mission Control Houston at 52 hours 14 minutes 4 seconds after liftoff. The next station to acquire will be the Hawaii tracking station in approximately 9 minutes. They're coming up on the separation maneuver in approximately 10 seconds and the crew has indicated that over the Coastal Sentry that they will do the burn on time using the forward firing thrusters instead of the aft firing thrusters. In this manner, they will be able to watch the Agena during the actual separation. At 52 hours 14 minutes and 40 seconds after liftoff, this is Mission Control.

END OF TAPE

This is Gemini Control 52 hours 24 minutes 3 seconds into the mission. We have acquisition with the Hawaii tracking station coming up at 33 seconds. That is some 20 seconds from now. We will stand by at that time to hear conversation with the astronauts on their separation maneuver from the Agena vehicle.

HOU ..its in the cockpit.

S/C Okay.

HOU Hawaii Com, Flight.

HAW Go Flight

HOU After those items, ask them to drink as much water as they feel is reasonable. In the meal tonight.

HAW 12, Hawaii.

S/C Go ahead, Hawaii.

HAW All right, we would like to know how it went during the burn.

S/C Okay. We used maneuver thruster to get aligned and aligning was okay. Also rate command was out to the tether line and does hold it. We made a burn and we had to correct the attitude with the thruster during the burn. We burned in orbit rate of plat mode.

HAW Orb rate and plat mode. Okay.

S/C Well, we did have to use a little maneuver
thruster to correct our yaw.

HAW Okay, and we would also like to know how it went
during the purge.

S/C Roger, the purge was normal.

HAW Roger, very good. Okay, and would like to
have you check and if you have less than
5 frames left on the film that you used to
photograph the eclipse you can go ahead and
stow it and use the other film pack for tomorrow.

S/C Roger, we have already done this.

HAW Roger, very good. Okay, another little reminder.
We would like for you to use as much water as
reasonable. Drink during your meal preparation.

S/C Roger, drink water, I have heard that before.

HAW Yes, and you will probably hear it again.

HOU Hawaii Com Flight.

HAW Go Flight.

HOU Let him know it also helps his fuel cell.

HAW Yes, I am sure he is fully aware of that. But I'll...

HOU Tell him anyway.

HAW Of course, our main concern on this is to help
out the fuel cell as much as possible. We're only kidding.

S/C Roger.

HOU Hawaii, is the computer on or off?

HAW It is on, he just switched it to prelaunch mode.

HOU Okay. Did you send us the OBC?

HAW Yes, it is on its way.

HOU And are you starting to gyro compass the Agena?

HAW That is affirm.

HOU Okay.

HAW And the L-band beacon just went off and am turning approach lights off now.

HOU Okay.

HAW And they are off. And he just turned the computer off.

HOU Roger, computer off.

S/C Hawaii.

HAW Go 12.

S/C Roger, we are going to power down unless they want us to have anything going.

HOU No we are ready to power down.

HAW You might go ahead and have at it and we saw the computer just come off.

S/C Roger. We are just holding by on the platform.

HAW Okay.

HOU Hawaii Com Flight.

HAW Go Flight.

HOU I would like you to ask the crew for a general comment on how they feel about the control system for the remaining experiments S-51 T-2 and D-10.

HAW Well, we would like a general comment on how you feel about the control system in regard to remaining experiments which are S-51 T-2 and T-10.

S/C This is 12. Rate command seems to hold it very decently. Big burns more than 6 or 7 we are going to have to use maneuver controls to stop it. ... you have to get certain angles or attitudes, I am not too sure. I think we can probably do it in rate command and try to get it, it will be a little expensive on gas.

HOU Okay, we are in pretty good shape on fuel. But he feels he can get the attitudes of the experiments reasonably well.

HAW That is affirm Flight.

HOU Okay.

HAW Okay, we are pretty good on fuel at the present time so we are not worrying too much about heavier usage of fuel.

HOU Hawaii, did you send the C-band beacon on to
 track the spacecraft.

HAW That is negative.

HOU Well, go ahead and do that.

HAW Okay.

HOU Hawaii Com Flight.

HAW Go Flight.

HOU What we have left is the crew status report.
 When they are ready to pass it out we will
 stand by at CSQ and Tananarive. At RKV
 and Tananarive.

HAW Okay, about all we have left for this day
 is crew status report and we will stand by
 over RKV and Tananarive for that.

S/C Okay, ... Houston ... rerendezvous, it might
 be accomplished.

HAW You think you have a chance of accomplishing
 rerendezvou.

S/C Well it depends upon how much gas we use.
 But it could be done.

HAW Okay, we have them thinking about it.
 Did you copy that Flight?

HOU Affirmative. We will look at that and see

HOU what it looks like tomorrow.

This is Gemini Control 52 hours 32 minutes 2 seconds into the flight of Gemini 12. You heard that conversation between the Cap Com - correction - between the Hawaii tracking station and Gemini 12, separation maneuver is complete, that is to separate it from the general vicinity of the vehicle. Purge was normal. They have stowed the eclipse film pack. They were advised to use as much water as reasonably possible during the meal preparation. Whereupon Astronaut Lovell said "I have heard that before". The L-band beacon is off, computer is off, they are going to power down. They have been given the okay to power down. Astronaut Lovell indicated that he felt they had enough fuel to accomplish tomorrow the S-51, T-2 and D-10 experiments. He indicated that probably would best be done through rate command. He said it would be a little expensive on gas, but he was then advised that they have plenty of fuel to go with. He was also questioned as to the possibility of rendezvous and he replied in the affirmative. So that will be determined this evening for an update on the flight plan for tomorrow's activities. We are going to stand by at the Rose Knot tracking ship and Tananarive for a final crew status report at 52 hours 33 minutes 36 seconds into the mission, this is Gemini Control.

END OF TAPE

This is Gemini Control 52 hours 50 minutes 2 seconds into the mission of Gemini XII. The spacecraft is presently coming up on the acquisition point with the Rose Knot tracking ship off the coast, correction, off the west coast of South America should acquire at 32 seconds past the minute some 10 seconds from now. We will stand by for what ever the crew status report passes between the Rose Knot and the Gemini XII crew before their sleep period. We are standing by now.

RKV is here Gemini 12 and agena

RKV

RKV Delta P lights are on and it looks like he is powered down.

HOU Roger.

RKV the picture is off and aligned. Disregard, it was off the

HOU Okay, the up grade of plus 5 degrees pitch is Pitch position gyro 5 1 degrees. Did you copy?

CSQ Roger, stand by. We do not have any indication that

HOU Say again, the agena guys weren't copying that.

CSQ Say again.

HOU The Agena guys weren't copying that, your transmissions you can give it to them post pass.

S/C Guess you're right,

CSQ Say again Bill.

S/C Set your horizon sensors off to real low.

Roger.

This is Mission Control. It does not look like we will have any crew conversation over the Rose Knot. It appears that the spacecraft is powered down for their sleep period. They did get a go ahead to power down for the sleep period from Hawaii. We will have entered our sleep period therefore from the time we approved they should enter it from the Hawaii tracking station some ten to twelve minutes ago. The black team is now off duty, Gene Kranz is flight director on the white team and is now on duty in the MCC. Pete Conrad is still Cap Com on duty here until midnight. At 52 hours 53 minutes 26 seconds in to the mission of Gemini XII this is Gemini Control....

END OF TAPE

This is Gemini Control 53 hours 33 minutes 31 seconds in to the mission of Gemini 12. We originally reported there would be no more voice contact with the astronauts from the time they were given an okay for a sleep period, however, we did have some reporting in from the crew and the final reporting was over Tananarive remoted with astronaut Conrad here in the control center and we bring you a tape of that status report now.

Tananarive remote

HOU Tananarive go remote

TAN Tananarive remote.

HOU Gemini 12, Gemini 12, Houston through Tananarive over.

S/C Roger , Houston 12 here.

HOU Three quick items we'd like you to leave cryo quantities switch in the H2 position tonight. I would like a PQI reading please. And we weren't quite clear about whether you ate meal 3 Bravo today in addition to 3 Alpha and Charlie, over.

S/C PQI 3 4 percent.

HOU Roger, copy 24 percent

S/C Negative, 3 4 percent. 3 4 percent

Hou Roger, 34 percent.

S/C And we're consuming 3 Charlie at this time.

HOU Roger, did you consume 3 Bravo for today.

S/C Yeah, we chewed 3 bravo too.

HOU Ah, that's good boys, thank you very much and
 Good Night.

This is Gemini Control (two B pumps is right though)

Tananarive LOS

This is Gemini Control 53 hours 35 minutes 14 seconds in to the Mission of Gemini XII, you heard that final recap over Tananarive with astronaut Conrad at the Cap Com here in the Control Center. We are now in a sleep period. The sleep period will terminate at 61 hours in to the mission or roughly 7 and 1/2 hours from this time. The spacecraft is powered down, the apogee is 162.1 nautical perigee 142.8 nautical miles, the OAMS system fuel is holding at 34 percent which is quite reasonable quite good. At 53 hours 53 minutes 56 seconds in to the mission of Gemini XII this is Gemini Control....

END OF TAPE

This is Gemini Control 54 hours 8 minutes 31 seconds in to the mission of Gemini XII. The spacecraft is just passing out of the acquisition area of the Hawaii tracking station and the last word from Hawaii is that the spacecraft is "Go" all the way on systems. This is taken from telemetry readout. We have had no voice contact with the astronauts they are sleeping. They will be awakened in about 7 hours. At 54 hours 8 minutes 57 seconds in to the mission, this is Gemini Control.

END OF TAPE

This is Gemini Control, 55 hours, 3 minutes, 33 seconds into the Mission of Gemini 12. The position of the Gemini 12 spacecraft during revolution number 35 is approximately 2 or 300 miles west of India. The Coastal station tracking ship should acquire 55 hours, 17 minutes, 21 seconds. The spacecraft is trailing the Agena vehicle by 37 nautical miles. The sleep period started at 53 hours and will continue through 61 hours. According to our surgeon, the crew of Gemini 12 is not asleep as of 54 hours, 45 minutes into the mission. However, they are resting. He anticipates them to go to sleep at any time, possibly on the next readouts that we will get from Coastal station that will be indicated. The heart rates are for Lovell 74 per minute, Aldrin 74 per minute. Respiration rate - Lovell 16 per minute, Aldrin 18 per minute. Water intake is good. They are both well hydrated, eating all meals as scheduled - correction - they have eaten all meals as scheduled. The surgeon is well satisfied with their condition at this time. At 55 hours, 4 minutes, 59 seconds into the mission of Gemini 12, this is Gemini Control.

END OF TAPE

This is Gemini control, 56 hours 3 minutes 34 seconds in to the mission of Gemini XII. The position of the Gemini 12 spacecraft is currently approaching the west coast of South America. The Rose Knot tracking ship now has acquisition of the spacecraft and will have for some 4 minutes more. The apogee of the spacecraft is 162.2 nautical miles perigee 143 nautical miles. Coastal Sentry reports at 55 hours 24 minutes 30 seconds in to the mission some 40 minutes ago, that both astronauts are asleep. The sleep period started at 53 hours in to the mission. It will end 61 hours in to the mission. At 56 hours 4 minutes 25 seconds in to the flight of Gemini XII, this is Gemini Control.....

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/13/66, 11:50 PM CST

TAPE 198, PAGE 1

This is Gemini Control, 57 hours, three minutes, 31 seconds into the mission of Gemini 12. The Gemini 12 spacecraft at this time is just past the east coast of China. The Coastal Sentry has lost signal approximately three minutes ago. At that time, they reported the spacecraft was go. They had no voice communication. However, they did have telemetry. Heart rate on Astronaut Lovell stood at 50 beats per minute. Aldrin -- 56 beats per minute. Respiration rate -- Lovell -- 13 beats -- correction, 13 per minute; Aldrin -- 11 per minute. The weather in the prime West Atlantic recovery area forecasts for tomorrow is good. Fifteen knot winds from the northwest. Five foot swells. Four foot waves. 2,000 foot scattered to broken. The weather in the prime area for Tuesday also looks good. In the West Pacific, Mid-Pacific and East Atlantic areas, the weather is anticipated to be acceptable for both Monday and Tuesday, Tuesday being the planned landing time. At 57 hours, four minutes, 52 seconds into the mission of Gemini 12, this is Gemini Control.

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/14/66, 12:50 AM CST

TAPE 199, PAGE 1

This is Gemini Control, 58 hours, three minutes, 31 seconds into the flight of Gemini 12. The position of the Gemini 12 spacecraft is presently over Africa in the 37th revolution. Coastal Sentry should acquire 58 hours, 28 minutes, 17 seconds or 24 minutes from now. We have had no voice contact with the astronauts. None was planned. Gemini 12 has been in a sleep period for some five hours and five minutes. They now stand at two hours, 56 minutes roughly to wake-up time. Flight Director Gene Kranz and the controllers here at the Control Center are updating tomorrow's flight plan, which should include the second and last stand-up EVA -- extravehicular activity; the D-10 ion sensing attitude control experiment; the S-51, sodium vapor cloud photographic experiment; the S-29, Libration region photography experiment; and also the T-2, manual navigation sightings of celestial bodies. One celestial body to be sighted in the T-2 experiment will be the star -- first magnitude star Betelgeuse. It's interesting in that this star is 200 million miles in diameter. That's some 14 million miles larger than the diameter of the earth's orbit around the sun. Gemini 12 now trails the Agena some 71 miles. It will gradually fall farther and farther behind. At 58 hours, five minutes, 34 seconds into the mission of Gemini 12, this is Gemini Control.

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/14/66, 12:50 AM CST

TAPE 199, PAGE 1

This is Gemini Control, 58 hours, three minutes, 31 seconds into the flight of Gemini 12. The position of the Gemini 12 spacecraft is presently over Africa in the 37th revolution. Coastal Sentry should acquire 58 hours, 28 minutes, 17 seconds or 24 minutes from now. We have had no voice contact with the astronauts. None was planned. Gemini 12 has been in a sleep period for some five hours and five minutes. They now stand at two hours, 56 minutes roughly to wake-up time. Flight Director Gene Kranz and the controllers here at the Control Center are updating tomorrow's flight plan, which should include the second and last stand-up EVA -- extravehicular activity; the D-10 ion sensing attitude control experiment; the S-51, sodium vapor cloud photographic experiment; the S-29, Libration region photography experiment; and also the T-2, manual navigation sightings of celestial bodies. One celestial body to be sighted in the T-2 experiment will be the star -- first magnitude star Betelgeuse. It's interesting in that this star is 200 million miles in diameter. That's some 14 million miles larger than the diameter of the earth's orbit around the sun. Gemini 12 now trails the Agena some 71 miles. It will gradually fall farther and farther behind. At 58 hours, five minutes, 34 seconds into the mission of Gemini 12, this is Gemini Control.

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/14/66, 1:50 AM CST

TAPE 200, PAGE 1

This is Gemini Control, 59 hours, three minutes, 31 seconds into the mission of Gemini 12. The Gemini 12 spacecraft is approaching the west coast of Africa. The Rose Knot tracking ship should have acquisition by telemetry in approximately seven minutes. We have had no voice contact, as was expected for some while now. The sleep period is now standing at six hours and five minutes. It's one hour, 56 minutes to wake-up time. Heart rates are Lovell -- 46, Aldrin -- 49. Respiration rates -- Lovell -- 14, Aldrin - 11. These readings were taken from the last pass over the Coastal Sentry tracking ship. At this time in the mission, all goes well with Gemini 12. This is Gemini Control at 59 hours, four minutes, 31 seconds into the mission.

END OF TAPE

This is Gemini Control, 60, 3 minutes, 32 seconds into the mission of Gemini 12. The position of Gemini 12 is over the east coast of China. Coastal Sentry has just acquired. We have no voice contact, nor is any planned. The sleep period now stands at 7 hours and 5 minutes. It should be approximately 56 minutes to wakeup time. An updated flight plan for today's activities, should be coming up very shortly. We are standing by for it. We anticipate we will have the second standup EVA, we will have the D-10, the ion sensing attitude control experiment, the S-51, sodium vapor cloud photography experiment, the T-2, manual navigation sightings of celestial bodies experiment, and the S-29, libration regions photographic experiment. The weather in the prime landing area in the west Atlantic is considered to be good for today with 15 knot winds from the northwest, five foot swells, four foot waves. The ceiling is anticipated to be 2000 feet, scattered to broken. Tuesday also looks good. It looks as good as Monday or better. The weather in the east Atlantic, west Pacific, and mid-Pacific landing areas, secondary landing areas is also acceptable. At 60 hours, 5 minutes, 11 seconds into the mission of Gemini 12, this is Gemini Control.

END OF TAPE

Gemini Control Houston at 60 hours, 46 minutes now into the flight of Gemini 12. Jim Lovell and Buzz Aldrin are now in their 38th revolution, the tag end of their 38th revolution. They're nearing acquisition with the Rose Knot Victor. We expect the crew to be awakened at this time and we'll stand by for any conversation that will pass between the Cap Com aboard the Rose Knot Victor and the Gemini 12 flight crew. Standing by now this is Gemini Control.

RKV Gemini 12, RKV.

S/C RKV, 12.

RKV Good morning.

S/C Is it morning already?

RKV Well, it's about that time. It's around, oh, 1:15 in the morning here.

S/C Okay, we'll believe you. Okay.

RKV We'd like you to turn your X-Ray and beta off at this time if you would.

S/C All right.

RKV And you can start a fuel cell purge at your convenience, 2 then 1.

S/C Fuel cell purge, 2 then 1.

RKV Give us a mark when you start, please.

S/C Starting fuel cell purge now.

RKV Roger, copy. Okay, we'll just talk back and forth here a little bit while you're purging.

RKV On this pass you'll be getting a flight plan
 update over Canary, and suggest you start your
 eat period as soon as you leave us here, and be
 advised that during the night your spacecraft
 looked real good on the ground.

S/C Sounds good. We'll start breakfast and standing
 by for the flight plan update over Canary.

RKV Okay, and also they'll probably be updating you
 on the phase adjust at that time.

S/C Roger.....

RKV What did you say, again, 12?

S/C I was wondering if that was for another eclipse.

HOU RKV, Houston Flight.

RKV Go ahead, Flight.

HOU Tell them that what we're going to try to do today
 and we'll start updating them over Canary, is try
 to get some of the high priority items done. To
 start with we're going to do S-51 this morning.

RKV Okay.

HOU Send us a Gemini Bravo.

RKV 12, they're going to be updating you over Canary
 as to some of the high priority items this morning
 and get ready for the S-51.

S/C Roger.

HOU RKV, Houston Flight.

RKV Go ahead, Flight.

HOU Did you get the X-ray off, the beta off?

RKV That's the first thing we told him. I'll confirm it with him.

HOU Okay. He got it all.

RKV Say again.

HOU He confirmed it.

RKV He gave me a roger when I told him to turn it off.

HOU Roger.

RKV Tape dump complete.

(PAUSE)

Gemini Control Houston. We're still in our pass over the Rose Knot Victor. There's no conversation going on at the present time. The Gemini 12 crew is probably involved in their fuel cell purge.

RKV Could you go to cryo switch to O₂, please.

HOU Don't forget your pumps, RKV.

RKV And would you turn your A pumps on at this time, both primary and secondary.

RKV Okay, would you switch your cryo switch to O₂ and leave it there, please.

RKV He has his A pumps on, Flight.

HOU Roger.

RKV Okay, 12, you're just about our LOS. We'll see you next pass around.

S/C Roger.

HOU RKV from Flight. A Bravo Gemini LOS.

RKV Say again, Flight.

HOU Gemini Bravo at LOS.

RKV Roger. We have LOS of both vehicles. Both vehicles are go.

Gemini Control Houston, 60 hours, 55 minutes now. We've just had loss of signal with the RKV. The next station to acquire will be Canary. This is at 61 hours, seven minutes into the mission, and over Canary the Cap Com there will pass on a flight plan update. Starting over Canary the Gemini 12 crew will power up their platform. This is scheduled to take place at 61:07. At 61:47, phase adjust maneuver, a small maneuver of some 5.5 feet per second retrograde is planned. And at 62:23 over the RKV, we'll have a crew status report. 62:31, over Antigua, a flight plan update and a planned landing area update. At 62:40, we'll start our first pass for the S-51, Sodium Cloud Photography. At 63:15 through 63:48, we'll have the T-2 experiment, Mode A, Sequence 1. The T-2 is the Space Navigational Sightings Experiment utilizing a space sextant, handheld. This will be done with the helmets and gloves off and the stars to be sighted with the sextant are Betelgeuse and Rigel. At 63:50, the Gemini 12 crew is scheduled to start their EVA preparation for their second standup EVA. At 64:15, the crew will start their second pass on the S-51 experiment. 64:30 through 64:50, the crew will be involved in EVA preparation. 64:50 we're scheduled to depress the spacecraft and from 64:50 through

GEMINI 12 MISSION COMMENTARY, 11/14/66, 3:32 A. M. CST

Tape 202, Page 5

65:40 the standup EVA is scheduled. At 65:40 the hatch is scheduled to be closed and repressing the spacecraft to begin. At 60 hours, 58 minutes now, this is Gemini Control Houston.

END OF TAPE

CYI TM solid, Gemini and Gemini is go.

Gemini 12, Canary Cap Com.

S/C Good morning there, Canarys, 12 here.

CYI Good morning. How are you this morning?

S/C That was a short night.

CYI Okay. Got a couple of bits of info for you here. First of all we're setting up the phasing maneuver because we were not able to burn the Agena last night and so we are giving you the phase maneuver to set up the position for tomorrow.

S/C Okay.

CYI And I have the phasing maneuver when you are ready to copy.

S/C Ready to copy.

CYI Okay. Purpose is phase adjust GETB 61 47 47, Delta V 5.5, burn time 09 second, yaw 060, core 25, 90055, core 26, 27 all zip. Thrusters forward, maneuver retrograde. Over.

S/C Roger, understand, phase adjust maneuver GETB
61 47 47, Delta V 5.5 feet per second, duration
9 seconds, yaw zero, pitch zero, address 25 -
90055, address 26, 27 - zeros, forward thrusters,
maneuver retrograde.

CYI Affirmative.

S/C Okay.

CYI I've got a notal update for you now.

S/C Roger, go ahead.

CYI Okay, time 61 00 58, rev 39, 40.9 degrees west,
right Ascension. 10 + 36.

S/C Roger, would you give me the degrees again?

CYI 40.9 west.

S/C Roger.

CYI Okay, one other item here. The Agena is out of ACS
gas so we won't be maneuvering it any more.

S/C Sorry about that.

CYI Okay, I've got a flight plan update for you now.

S/C Roger, go ahead.

CYI Okay, 61 07, power up the platform, 61 00 to 62 15
eat period. 61 30 align platform. And at 61 47 47
the phase adjust maneuver that I gave you. At 62 23
at the RKV we'll take a crew status report. At
62 31 at Antigua, they'll give you block 7 PLA
update and also your S-51 update. And 62 46 S-51,
first pass. At 63 14 43 sunset, T-2, load A, sequence 1.

63 50 to 64 15, start EVA prep. At 64 05 have an S-51 update, 64 21 S-51 second pass, 64 30 continue EVA prep, at 65 17 56, will be your EVA sunrise time.

S/C Roger, say again 65 17 56?

CYI That's affirmative. EVA sunrise time.

S/C Roger.

CYI And at 66 26 at Carnarvon, they'll give you another flight plan update and at 67 15 end of post-EVA period. That's the end of the flight plan update.

S/C Roger, understand.

CYI And your systems are looking real good down here.

S/C Roger, let me go over a couple that I'm not too sure of. 63 14 14 was sunset for T-2?

CYI Negative. 63 14 43.

S/C 14 43.

HOU Kano go remote.

CYI We've got about a minute to LOS, here, 12.

S/C Roger. I have that update.

HOU Kano go remote.

KNO Kano is remote and we have acquisition.

HOU Gemini 12, Houston Cap Com through Kano.

S/C Roger, Bill.

HOU Morning. Say, Jim, for your second standup EVA we'd like for you to shoot some pictures after sunrise of the star field you took in the night-time if you think you have time for it. How do you feel about that?

S/C You want us to take some pictures after sunrise
 of the star fields we took during the night, is
 that what you said?

HOU That's correct. We can give you some pointing
 commands if you're agreeable and if you are ready
 to copy.

S/C Roger. We're ready to copy. We'll see what we
 can do about it.

HOU Well, let me give you these and give you a chance
 to think about it. In your hardsuit checklist
 for your sunrise pointing, the sun will be yaw
 47 degrees right, on the horizon. Okay, for
 your post-sunrise pictures, at sunrise + 7 minutes,
 that's at 34 minutes on the elapse timer, we'd
 like you to pitch up 125 degrees. 125 degrees up,
 yaw 20 degrees north. We'd like you to take
 several one second photographs. Taking care to
 keep the sun off the camera and off the -- any
 part of the spacecraft the camera might see.
 Another note we have for you is for your night
 stars, we'd like for you to stress Orion and
 possibly work down in the regions toward Gamma
 Velora.

S/C Okay.

HOU Could you tell us if you have any water stored
 in bags on the spacecraft at this time?

S/C We just started preparing breakfast so we do
 have water and food in one meal.

HOU Okay, mighty fine. We just wanted to make sure
 you didn't have any bags with water in them when
 you depress the cabin.

S/C Oh. No not this time.
 Houston, 12 here. We pitch up 125 and yaw to the
 north. That's a yaw first, pitch?

HOU Negative. Pitch up and then yaw and we are assuming
 you're having the camera on the S-13 bracket this
 time.

S/C Roger, understand.

HOU Okay, think that over if you think you could swing
 it; it would give us some pretty good data here.

S/C Okay, we going to have two other platform updates?

HOU That's affirmative.

S/C Okay, why ^{don't} we get a pointing command on the
 eight ball ...?

HOU That's what this is. That's on the eight ball,
 125 degrees up.

S/C Okay, then there must be a yaw first and then
 pitch.

HOU Standby.
 Okay, we'll have to double check that and give
 you some eight ball readings over ...

END OF TAPE

CYI Okay, we'll have to double check that and give
 you some late followings over the next pass.

S/C Roger.

CYI You've got 30 seconds to LOS, Gemini 12.

CYI LOS, LOS.

Gemini Control Houston, 61 hours, 18 minutes now into the flight of Gemini 12. The phase adjust burn passed on to the crew over Canary - this is a preliminary maneuver to establish a standoff position for tomorrow between the Gemini 12 spacecraft and its Agena target vehicle. Initially, it had been planned to burn the Agena following separation for this maneuver, but this was not possible and it was not possible because we were out of Agena ACS gas. The usage of Agena ACS gas was heavy because the Agena was loaded with propellant since we made no PPS burn for high apogee in this mission as had been originally planned. At 61 hours, 19 minutes into the mission now, our next station to acquire will be the Coastal Sentry Quebec. This will be at 61 hours, 41 minutes, 42 seconds and this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 61 hours, 41 minutes into the flight of Gemini 12 at this time. Command Pilot Jim Lovell and Buzz Aldrin are approaching acquisition with the Coastal Sentry Quebec. We expect acquisition momentarily with the Coastal Sentry Quebec in the western Pacific and we're standing by now for that pass.

CSQ AOS Agena.

HOU Roger.

CSQ Flight, CSQ.

HOU Go ahead.

CSQ We've got telemetry solid on Gemini.

HOU Roger.

CSQ Spacecraft is go.

HOU Roger.

CSQ And we got the Delta P lights and I've got AOS
 on Gemini.

HOU Roger.

HOU CSQ Cap Com, AFD. Would you give us contingency
 Charlie on Agena?

CSQ Roger.

HOU CSQ, Houston Flight.

CSQ Flight, CSQ.

HOU Okay, Bill, thanks for staying up. This data
 looks like the fuel cells don't look too bad.

CSQ Sure looks like we've got a good spacecraft.

HOU Yeh, we'll see you in the morning.

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Tape 205, Page 2

CSQ

Okay.

END OF TAPE

Gemini Control Houston, 62 hours, 7 minutes into the flight of Gemini 12 at this time. Jim Lovell and Buzz Aldrin are currently passing over the south Pacific in their Gemini 12 spacecraft. We've been out of contact for awhile since they're passing well to the south of both Canton and Hawaii tracking stations. Meanwhile in Mission Control Houston, Mr. Francois Pene, a representative of the French government, is actively involved in coordinating activities leading up to the Centaur launch this morning from Hammaguir, Algeria. The sodium rocket will be launched in support of the S-51 photographic experiment. Here the pilot takes pictures of the sodium trail using his Maurer 70 mm camera with a special filter and film for yellow sodium light. During this time, the command pilot holds attitudes and records times of picture taking. Both Jim Lovell and Buzz Aldrin will be wearing special goggles during this experiment. The purpose of the experiment is to measure by photographic techniques, the wind velocities in the upper atmosphere. This is accomplished by ejecting a sodium cloud from the Centaur sounding rocket and the pictures taken of the clouds measured from about 60 to 90 nautical miles. The rocket, when launched from Hammaguir, Algeria, will eject a cloud from about 37 to 97 nautical miles. This cloud will be a very faint yellow or almost whitish cloud and when we first see it, it should appear as an inverted teardrop. As the spacecraft is

swung around to the side, it should appear as a kind of mushrooming horseshoe. Now one point worth mentioning here the Earth will be about 250 times brighter than the cloud. We are currently looking at a Centaur liftoff time of 62 hours, 41 minutes, 58 seconds GET. Our T-0 time for the experiment or the start of picture taking is at 62 hours, 46 minutes, and 8 seconds, GET. A little bit about the Centaur rocket. It is about 20 feet long, it has a body diameter of some 11 inches. The maximum launching weight is 1080 pounds approximate. And performance speed at approximately 70,000 feet would be 3,378 miles per hour. This is Gemini Control Houston as the Gemini 12 spacecraft continues its quiet pass across the south Pacific, and at 62 hours, 10 minutes, Gemini Control Houston.

END OF TAPE

GEMINI 12 MISSION COMMENTARY, 11/14/66, 5:09 A. M. CST

Tape 207, Page 1

Gemini Control Houston, 62 hours, 23 minutes now into the flight of Gemini 12. The Gemini 12 spacecraft is approaching acquisition with the Rose Knot Victor. This is the Rose Knot Victor located - the ship located off the western coast of South America. This will be the last pass of the morning over the Rose Knot Victor tracking station. We expect a crew status report at Rose Knot. We're standing by now for acquisition and this is Gemini Control.

RKV Gemini 12, RKV.

S/C Gemini 12.

RKV Roger, stand by for your crew status report.

S/C is 1914 A04, 8 point....

RKV In both....

S/C Yes, both....

RKV Roger.....

S/C Roger, we slept about 5 hours...

RKV quality of the sleep period.

S/C Fair.

RKV Fair. Roger, I have a PQIA when you're ready to copy. You ready?

S/C Stand by. Go ahead.

RKV Area 41 dash Alpha Charlie, 63:48:53, 20 + 49, 26 + 26. Area 42 dash 1 Bravo, 65:15:35, 20 + 49, 26 + 27. Bank angles for both areas, roll left 85, roll right 95. Weather in both areas,

good. No required. Did you copy?

S/C

Roger, we copy.

RKV

I'll get the rest to you a little bit later.

S/C

Roger. Do you want the status of this phase
adjust burn?

RKV

Okay, go ahead.

S/C

Roger, well, it was very poor. By the time we
got the platform aligned - we did not get the plat-
form aligned by the time we burned. We attempted to
burn but We did not have enough time to get
the platform aligned by the time we powered up.
Everytime we either pitched or yawed we got left
roll because it We got off at rate command
in high orbit and then the diverge... by using
maneuver thrusters until we get all the rates damped
out and then we can then align the platform. This
requires quite a bit of time and to keep your flight
planning any will have to be turned over to
....time to do it. We also used about 5 percent of
our fuel to align the platform this morning - 4 per-
cent, from 34 to 30 percent.

RKV

Roger, copy. 34 to 30 percent. On platform align-
ment.

HOU

How long did it take?

RKV

How long did it take? Did you figure? How long did

it take to align it?

S/C About - I'd say about 25 minutes to 30 minutes
just to stay aligned, to get the position.

HOU Roger, understand.

S/C gave us the time to align the platform after
..... and unfortunately we were just going into
darkness. At that time it was a very good hack
and to get the thing started but the attitude
problem caused us to drift off.

RKV Roger, they'll pick the rest of this information
up with you at the next site. We're just about at
our LOS now.

S/C Roger.

HOU Send us a main, RKV?

RKV Gemini main?

HOU Affirmative.

RKV Okay, did you copy all that information, Flight?

HOU Affirmative. And also a Gemini Bravo.

RKV Gemini Bravo. We've had LOS both vehicles.

Gemini Control Houston, 62 hours, 29 minutes now. The next station
to acquire will be Antigua at 62 hours, 31 minutes into the mission.
This is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 62 hours, 31 minutes into the mission now. We are standing by for acquisition at Antigua.

S/C Okay, Houston, 12 here.

HOU Roger, I have your S-51 update.

S/C Roger.

HOU Roger, S-51. 62 56 08, yaw 28 degrees north, pitch 12 degrees down. GMT 11 32 41. Copy?

S/C Roger, understand at 62 46 08, S-51. I have the yaw and pitch, but what was that last?

HOU I understand you want a GMT time acq, is that correct?

S/C No, we want a Delta T, when to take pictures if we don't see it.

HOU Roger, start at that time to take pictures. We'd like you to take, besides the sequence camera, 12 exposures with the Maurer.

You understand, 12?

S/C Roger, Houston. Twelve Maurer exposures.

HOU Roger. That's whether you see the cloud or not.

And standby for a GET time acq. At 63 33 10.

1 Mark. 62 33 10.

S/C Roger.

HOU I have your S-51 second pass when you are ready to copy.

S/C Okay.

HOU 64 20 59. Yaw 12 degrees north, pitch 11 degrees down. We'd like you to take 6 exposures with the Maurer. Over.

S/C Roger. I have that.

HOU And with respect to your standup EVA post-sunrise stars. You ready to copy?

S/C I want to get the last part of that.

HOU Roger, I have a pointing angles for your post-sunrise EVA stars. Over.

S/C Roger.

HOU Okay, that's yaw 160 degrees north, pitch 40 degrees up. Pointing is not critical.

S/C I'm glad you said that because its going to be list about 30 degrees.

HOU Its going to be what?

Roger, that's fine. Just spray the general area with exposures if you think you have time.

S/C Is there any pre-sunrise stars?

HOU Pre-sunrise stars. We'd like for you to concentrate on Orion and in the area from Orion to Gamma Velorum. Would you like pointing for that?

S/C It might be helpful if we're to get to the sun at sunrise, we'll need a good to fair amount of time to get down there. Especially hardsuit with our attitude system that's not working too well. How about giving us a little rundown on the priorities.

Which is more important?

HOU Orion is first priority. If you have time work your way down to Gamma Velorum. Take as many pictures as you think you have time for. We'll give you an Orion pointing command some station prior.

S/C Roger, understand. I meant the priority between Orion, Gamma Velorum and the sunrise pictures.

HOU Sunrise is number one priority.

S/C Yeah. That means we've got to be there.

HOU That's affirmative.

Thirty seconds.

Gemini 12, if you recheck your biomed circuit breaker.

S/C That's affirm.

HOU Thank you and we're at LOS.

Gemini Control Houston, 62 hours, 37 minutes now into the flight of Gemini 12. The next station to acquire will be Canary. This is at 62 hours, 40 minutes, 46 seconds into the flight. And during this pass, the Gemini 12 crew is expected to perform the S-51 experiment. The sodium cloud photography experiment during this pass. So at 62 hours, 38 minutes now, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 62 hours, 40 minutes now into the flight of Gemini 12. Jim Lovell and Buzz Aldrin are approaching acquisition now at Canary. It is during this pass, they are expected to perform the S-51 experiment. We are standing by now. Standing by for acquisition with Canary.

CYD Gemini 12, Canary Cap Com standing by.

Gemini Control Houston. Our countdown clock shows 46 seconds now for the liftoff time of the French Centaur rocket and we are standing by.

Gemini 12, Canary. Sending you a TX.

We show T-0 and we are standing by.

We have confirmation of Centaur liftoff.

CYI Houston Flight, Canary Cap Com.

HOU Yeah, Canarys, the launch went, looks nominal so far.

CYI Roger. I'll relay that to 12. Gemini 12, Canary
Cap Com.

S/C Go ahead.

CYI Okay, S-51 is on its way.

S/C Okay.

Gemini Control Houston. The French confirm a nominal launch time right on the money.

S/C Canarys, 12.

CYC Go Canary -- Go, 12.

S/C We never got a Delta T as to when to start taking pictures and we -- we didn't see the rocket.

CYI Say again, you want a Delta T for what?

S/C We want a Delta T after the acquisition in time to start taking pictures, but we don't see it.

 They never gave it to us.

CYI Okay, standby one.

HOU Start at the acq time.

CYI Say again?

HOU Start at the acquisition time, that we gave him.

CYI Okay, 12, Canarys. They want you to start at the acquisition time that they gave you.

S/C Okay, thank you.

The Gemini 12 crew should have begun their photography some 10 to 15 seconds ago.

CYI Houston Flight, Canary Cap Com.

HOU Go ahead.

CYI Okay, he's in position at this time for the S-51.

HOU Roger.

CYI And the tape dump is complete.

HOU Roger.

Canary, send us another A, Gemini.

CYI Roger.

END OF TAPE

No conversation with the crew. They are no doubt busy at this time.

CYI Gemini 12, Canary Cap Com. About one minute to LOS, we'll be standing by.

S/C Roger. No joy.

CYI Roger, understand. Did you copy that, Flight?

HOU Copied.

CYI Houston Flight, Canary Cap Com. We've had LOS both vehicles and both vehicles were go.

HOU Kano go remote.

KNO Kano's remote. We have acquisition.

HOU Gemini 12, Houston Cap Com, through Kano and standing by.

S/C Roger, Houston. We took the ...

HOU Roger, understand you took the photographs any way but no joy.

S/C That's affirmative.

HOU Okay, nice try.

HOU We're right on the ragged edge of Kano here. We've got about one minute to LOS.

KNO Kano has LOS.

Gemini Control Houston, 62 hours, 52 minutes now into the flight of Gemini 12. We've just had LOS at Kano. During our next revolution over the Sahara and at about 64:15 ground elapsed time, the time passed

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to the crew by Bill Anders at Antigua; this is the time that our Gemini 12 crew will again attempt to photograph the Sodium Cloud which was launched in the French Centaur rocket over the Sahara. 62 hours, 52 minutes, 43 seconds now, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 63 hours, 23 minutes into the flight of Gemini 12 at this time. Jim Lovell and Buzz Aldrin are now in their 40th revolution in the flight of Gemini 12. The spacecraft is currently clocking an apogee of 158.3 nautical and 143.3 nautical for a perigee. The Gemini 12 is now passing over Woomera. We sidestepped Carnarvon on this pass. We'll have no voice contact with the spacecraft although we are receiving data from the spacecraft on the ground. At this time, Pilot Buzz Aldrin should be involved with the handheld sextant experiment. This is the T-2 experiment, space navigational sightings. Aldrin in the case of this experiment, takes sightings and marks the times for the sightings. The Command Pilot is busy recording the data and controlling the spacecraft attitude. They are scheduled to perform this experiment at this time with the helmet and gloves off. At 63 hours, 24 minutes, 40 seconds, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 63 hours, 50 minutes into the flight of Gemini 12 at this time. The Gemini 12 spacecraft is still making its southerly pass over the Pacific, and at the present time, the French are counting down a second rocket. This was initially scheduled as a backup rocket. At Hammaguir, Algeria, a second rocket to be launched in conjunction with the S-51 sodium cloud experiment. The French only a short while ago, proposed the launch of their backup rocket in this endeavor. We expect that the crew will receive an update regarding this during their pass over Antigua. At 63 hours, 51 minutes, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 64 hours 3 minutes now into the flight of Gemini 12. Jim Lovell and Buzz Aldrin now are nearing acquisition with Grand Turk, Grand Turk station. No doubt at this time they are heavily involved in their preparations for their second standup EVA. Also during this pass, during this pass over Grand Turk and Antigua we expect the crew to receive an update on S-51. Standing by now for conversation with the Gemini 12 crew. This is Gemini Control Houston.

HOU Gemini 12, Houston Cap Com, over.

SC Roger Houston, Gemini 12.

ANT AOS Antigua.

SC Houston

HOU Roger, Houston. The spacecraft looks good, they have an S-51 info for you. The French are going to launch a second rocket. Your acq times are good for the second half. We'd like to have you start your photos at your acq time and take eight exposures with the Maurer. Over.

SC Roger, understand. (garble) How about putting back the EVA one rev so it will give us a little more time to get squared away?

HOU I understand you are having trouble in EVA prep and your requesting us to consider putting the EVA back one rev, is that correct?

SC Houston, I'll say again, we're running into a time difficulty due to the petroleum system and the fact that we've got a - can't really control the spacecraft plus do everything else and we'll try and get the S-51 but it might take us a little longer to get the EVA ready to go and we'd much rather take our time and do a good job then to rush into it and maybe open up hatch towards the end of the night period.

HOU Gemini 12, Houston, roger. You can plan your EVA one rev later. We'll update your times when we have a chance.

SC Roger, Houston. One more discretion, the only way we can control yaw, right yaw, is with No. 12 maneuver thruster. Now, what is your feeling on doing this EVA?

HOU Roger, we'll think that over. Okay?
Gemini 12, Houston. We'd like for you to do a 30-second O2 purge on both sections now, and would you check your delta P circuit breaker before you do it?
Do you copy?

HOU Gemini 12, Houston Cap Com do you have your delta P lights on?

SC That is affirmative, their on.

HOU Roger, copy. We show them now on the ground.
I'd like to give you one more block PLA update
if I could, if you are ready to copy.

SC Houston you are coming in very weak, we can
barely read you.

HOU Roger, we'd like to give you one more PLA
update.

SC Roger.

HOU Roger. 43-1 alpha, 66 50 05, 20 + 49, 26 + 23,
copy?

SC What was that area number again Houston?

HOU Area 43-1 alpha.

SC Roger, 43-1 alpha.

HOU That will keep things going for a couple of
revs and when we get squared away on a new
flight plan we'll give you the rest of them.

Gemini Control Houston, we still have acquisition over Antigua
at this time. Presently there is conversation going on in the
Control Center. Taking a quick look at updating our EVA plans
and we are continuing to standby on this pass.

HOU Gemini 12, Houston Cap Com, over.

SC Roger Houston.

HOU Roger, we are thinking that in order to avoid
this yaw problem with the maneuver thrusters

during the EVA, considering the possibilities of holding the Maurer in your hand. How do you feel about that?

SC Well we were just discussing that.

HOU Okay, we'll start our plan with that in mind and when you have a chance to think about it a little bit more let us know.

SC Roger. Bill, when we try align the platform, right now we're in SEF at PLAT, and if we control the range to almost nothing and then go to align, she stays. But if we don't do that, nothing is going to hold in rate command or PLAT or anything, it is just going to go. The only way we can stop it is with maneuver thrusters.

HOU Roger, understand. You think you would develop to high a rate if on EVA?

SC Well I don't know. We could probably do it if we just leave it in platform mode. Now for the T-2 experiment we just completed, we were able to align on the stars by using the maneuver thruster and very carefully using pluse mode. But of course, we won't be able to do that EVA if we can't fire number 12 thruster.

HOU Roger.

FD One minute to LOS

 Three minutes to Canary

ANT LOS Antigua

Gemini Control Houston, 64 hours 13 minutes, we've just had
LOS with Antigua. The next station to acquire will be Canary
at about one minute and 30 seconds from now. As you heard
the EVA plan might be revised to move the time back one revo-
lution later. This cropped up during this pass when Jim
Lovell indicated to Cap Com, Bill Anders, that he can yaw
right by - only by using the number 12 maneuver thruster.
This of course will be under discussion in Mission Control.
We are standing by now for acquisition at Canary.

END OF TAPE

HOU Canarys, TM will be on at your acquisition.

HOU Canary Cap Com, AFD.

CYI AFD, Canary Cap Com.

HOU The TM will be on at your acquisition.

CYI Roger, how about the C-band?

HOU Standby.

 It's also on.

CYI Okay, and you want us to TX it off, right?

HOU Rog.

CYI Okay, we have TM solid on the Agena. And it's
 go.

HOU Roger, Canarys.

CYI Okay, we have C-band track on the spacecraft,
 but no TM.

HOU Roger.

 Have you tried the command at all?

CYI That's affirmative.

HOU Still nothing?

CYI Still nothing.

HOU Okay, maybe you better try circuit breakers,
 I guess.

HOU Canary, from Flight.

CYI Go ahead, Flight.

HOU You say you have no TM?

CYI That's affirmative.

HOU Okay, stand by, let me find out whether the S-51 went. We don't want to interrupt that. Let's see, you have how much pass time you have left? Plenty.

CYI Oh, we've got quite a bit yet.

HOU Okay, standby.

CYI Okay, TM's coming in now.

HOU Roger.

Canary Cap Com, Houston Flight.

CYI Go ahead, Flight.

HOU Okay, it went off okay.

CYI Okay, fine. We've got TM now.

HOU Okay, you might tell him that.

Gemini Control. That was the Centaur rocket.

S/C 12, Canarys.

CYI Roger,.it looks good down here on the ground. The S-51 is on its way and is looking nominal at this time.

S/C Roger.

CYI Sending a TX.

S/C Rog.

(pause)

Gemini Control Houston. We're still over Canary. No conversation transpiring at the moment. No doubt, the crew is very busy with the S-51 cloud photography.

CYI Houston Flight, Canary Cap Com.

HOU Go ahead.

CYI Okay, his attitudes are good for S-51.

HOU Roger.

Send us another Gemini A, please.

CYI Roger.

HOU Send us an Agena main, too. An Agena main also.

CYI Roger.

HOU Canary, from Flight.

CYI Go ahead, Flight.

HOU Okay, they have visual acquisition from the ground of the cloud on this one.

CYI Okay. 12, Canarys. They've had visual acquisition of the cloud from the ground.

S/C Wish we could say the same. That's where we ought to be.

S/C Eight pictures taken. No observations.

CYI Roger, understand. No joy.

Gemini 12, Canarys. One minute to LOS. I need your INS-51.

S/C We saw no cloud, Canarys. We looked and we had good pointing commands this time, and it's good spacecraft control for a change. Couldn't see

a thing.

CYI Okay.

S/C You know what they say, Canarys. C'est la vie.

CYI Roger, that.

S/C Oh boy. This is what that means.

Que, sara,sara.

CYI We've had LOS both vehicles, Flight.

HOU Roger.

Kano remote.

KNO Kano is remote.

HOU Gemini 12, Houston Cap Com through Kano.

S/C Roger, Houston.

HOU Houston, Gemini 12 you're right on the ragged
edge of Kano. We're not reading you.

Gemini Control. We're at the outer ring of acquisition at
Kano. We've had no real contact with the crew although we had a
momentary contact. We're standing by.

HOU Gemini 12, Houston Cap Com through Kano and
standing by.

S/C Roger. Houston, how do you read us now?

HOU Reading you five by. You've got about 45 seconds
to LOS.

S/C Roger. We're right on the point that time, Bill.

We sure looked and just goggled all ways, but we didn't see a thing.

HOU Okay, real nice try and we're kicking around doing the EVA in plat mode with a handheld camera.

S/C Roger. One other thing about S-51. There's a lot cloud coverage up there this time and this makes the area a lot brighter.

HOU Understand, thank you.

KNO Kano has LOS.

Gemini Control Houston. 64 hours, 27 minutes now into the flight of Gemini 12. We've just had loss of signal over Kano. As you heard earlier, during our Canary pass, the sodium cloud following the launch of the Centaur rocket was sighted from the ground; however, Jim Lovell advised that it was not seen from the spacecraft. However, he added that he felt that they had good pointing commands for their photography during this particular revolution. The -- however, it was considered very doubtful prior to this experiment that the crew would be able to see the cloud visually, even under optimum conditions. As we had indicated earlier, the desert surface is some 250 times brighter than the sodium cloud. At 64 hours, 29 minutes, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 64 hours, 52 minutes now into the flight of Gemini 12. The Gemini 12 spacecraft is approaching acquisition with Carnarvon station. Carnarvon station in Australia and we're standing by for this pass over Carnarvon.

CRO All systems are go on the Agena.

HOU Roger.

CRO 12, Carnarvon standing by.

S/C Roger.

HOU Carnarvon Cap Com, Houston Flight.

CRO Go ahead.

HOU Okay, check with the crew. We assume he's going ahead with his EVA prep. We'll talk to him over the states concerning the control situation and we'll have a recommendation over the states about EVA.

CRO Okay.

CRO Agena's in track at Carnarvon.

HOU Roger.

CRO And we're showing activity on thrusters 2 and 4. It's either that or he's opening and closing the circuit breaker.

HOU Okay.

CRO 12, Carnarvon. All your systems are go here on the ground. In regards to your control situation

for EVA, we'll talk to you over the states.

S/C Roger, understand.

HOU Carnarvon from Flight.

CRO Go ahead.

HOU You might ask him how the EVA prep is going,
as they're progressing on with it.

CRO Okay. How's your EVA prep coming along?

S/C Well, we're working on it, Carnarvon.....

CRO Roger.

S/C We have some camera shuffling to do due to the
S-51 experiment.

CRO Okey doke.

(PAUSE)

No conversation with the crew at this time but we're still
standing by as we pass over Carnarvon.

HOU Carnarvon Cap Com, Houston Flight.

CRO Go ahead.

HOU Query the crew and see if they can copy 44 dash 1
Bravo and 45 dash 1 Alpha and that will take them
quite a ways. We won't have to bother them for
awhile then.

CRO Okay.

HOU I think we got to that point on the PLA's.

CRO Okay.

CRO 12, Carnarvon. Do you have time to copy two PLA

updates?

S/C We can take time.

CRO Okay, if we give you these two it'll keep you updated there for awhile. We won't bug you too much.

S/C Go ahead.

CRO 44 dash 1 Bravo, 68:25:41, 20 + 37, 26 + 17; area 45 dash 1 Alpha, 70:01:30, 20 + 18, 25 + 56.

S/C Roger, do you have bank angle?

CRO Roll left 85, roll right 95.

S/C Okay, fine.

CRO Flight, Carnarvon.

HOU Go ahead.

CRO Okay, we show them in platform mode and in that mode we're getting considerable activity on that thruster no. 4.

HOU Yeh, it's probably not getting anything out of it. It keeps trying.

CRO Rog. One minute to LOS, standing by.

HOU Carnarvon from Flight. We're seeing the same thing over here on that thruster.

CRO Okay.

CRO Carnarvon has LOS Agena.

HOU Roger.

CRO LOS Gemini. All systems go.

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HOU

Roger.

Gemini Control Houston. We've had loss of signal over Carnarvon. The crew is still involved in that preparation for standup EVA and as was indicated to the crew, they will be updated during their stateside pass, regarding their extravehicular activity.

END OF TAPE

Gemini Control Houston, 65 hours, 37 minutes now into the flight of Gemini 12. The Gemini 12 spacecraft is approaching acquisition range with the Eastern Test Range and we are standing by now for conversation that might transpire during this pass. Standing by, this is Gemini Control Houston.

GTI AOS Turk.

HOU Gemini 12, Houston Cap Com, over.

S/C Roger, Houston, 12 here.

HOU Okay, 12, we've been kicking this EVA thing around; we'd like to -- our plan is to have you go EVA in plat mode and for Buzz to hold the Maurer in his hand for the photographs. How does that see to you?

S/C Okay, Houston. You've seen us, but let's go over that. We'll be in SGS plat mode and for Buzz to hold the camera for photographs. Okay, now, here are the problems along that line. If Buzz is to take photographs of the sunrise, he needs a visor. Now, he can take the photographs up until the sun comes up, then of course, he can't look that way any longer.

HOU Okay, be advised you have a 40 degree field of view on the Maurer. You're going to be behind the hatch. The sun will be 47 degrees right,

down 17 degrees. I'm pretty sure that Buzz is going to be in the shade. The question is, will he be able to get the camera looking at the sun?

S/C

Well, now that's another question. We don't know just how well we can handhold it, but we'll give it a try. Houston, 12.

HOU

Roger, we don't think there is a problem with Buzz and the visor as long as he doesn't look directly at the sun. We think that if he just holds the camera in the general area, he'll be okay.

S/C

Roger. What we'd like to do, we're almost prepared for EVA. We'd like to get out and over the hatch in daylight, get squared away, jettison the gear, do the exercise, and go into the night pass all squared away for the photographs. Do you concur?

ANT

AOS Antigua.

HOU

Roger, will that be this daylight pass?

S/C

That's right. And we'll stay that way and when we go into the next daylight, we'll take the sun pictures and then we'll ingress.

HOU

Roger. How much longer do you think before you'll be ready for depress?

S/C We have to go through a couple of suit integrity checks and that's about it. I'd say in 15 or 20 minutes..

HOU Roger, stand by.

 Gemini 12, Houston, you're go for depress on your option. We would like to do the exercise over a manned site. Either Canarys or Carnarvon. At your choice.

S/C Roger, you prefer over a manned site, roger.

HOU That is affirmative.

S/C We'll get all squared away and then we'll go ahead.. We'll check suit integrity checks.

HOU Roger, I'm ready to give you some new times, here, if you're ready to copy.

S/C Stand by.

 Okay, go ahead.

HOU Roger, your sunrise time for this coming rev will be 66 47 57. And I say again, the sun will be 47 south, down 17.

S/C Say again that time, please.

HOU Sunrise 66 47 57.

S/C Roger. The sun 66 47 57.

HOU Roger. Now, we'd still like you to try to get the night star photos if possible. Pointing is real loose, you can hold the camera up and just spray the area.

S/C Roger, but you want me to keep -- maintain the spacecraft in the plat mode SEF, is that correct?

HOU That is affirmative. We'd like for you to concentrate on Orion and the area down to Gamma Velorum.

S/C Roger, understand. These are all one-second pictures, am I right?

HOU That is affirmative.

S/C Okay.

HOU If you can, after sunrise, we would like to have you point the camera back 125 degrees, or roughly 30 degrees behind the zenith and take another couple of pictures, or several more pictures, which will pick up about the same star field.

S/C Roger, you understand though that we won't have to be outside to get the sunset to get these -- to get these photographs because Orion will be rising all the time and it'll make it harder for Buzz to take the pictures.

HOU Roger, we understand. You can take the pictures of Orion at any time during the night if you could just turn that camera back and point it back up over Buzz's shoulder, that's over his left shoulder, with the sun off the camera during the day and take several pictures, we'd appreciate it. But it's your option, if you

don't think you have time, don't do it.

S/C Roger. How about some Hasselblad pictures?

HOU Roger, understand Hasselblad. Say again on the Hasselblad.

S/C We've got it all ready to go. We can probably get some of each.

HOU Roger, and be advised that the weather over the States is exceptionally clear today.

S/C Roger. Will we be over that?

HOU It looks like if you're getting out this early, you'll probably have to come on in.

S/C We can stay out if that's okay.

HOU Stand by. We'll mull that over a bit, Gemini 12. Another point, if the Delta P lights bother you for the light -- for the night pass, you can go turn the circuit breaker off.

S/C Okay. That's not a bad idea. I think we will.

HOU Gemini 12, Houston. I say again, if you try the pictures of the stars in the daylight, try keeping the sun off the camera, and possibly have the camera pointed so that it will not see any illuminated part of the spacecraft.

S/C We understand. The stars in the daylight.

HOU Roger.

S/C Roger, the general area is 30 degrees after the
zenith, is that affirmative?

HOU Roger, that's valid for about five minutes after
sunrise, about 30 degrees after zenith, 15 north
to 20 south of track.

S/C Roger.

ANT LOS Antigua.

S/C Maybe somebody can figure out the angles from the
sun, if they have it handy here, because actually,
the stars will be at a 6th point relative to the
sun.

HOU Okay, if you just bring it straight up from the
sun to the zenith, about 120 degrees, you'll be
in good shape.

HOU Bermuda, remote.

Bermuda, go remote.

BDA Bermuda is remote.

END OF TAPE

SC Houston, 12.

HOU Gemini 12 calling Houston, go ahead.

One minute to LOS.

SC Roger, Houston, 12.

HOU Canary is in 2-1/2 minutes.

SC Understand, 2-1/2 minutes.

It looks like after this one you can call us
the litter-bug flight.

HOU Be advised you are at LOS and fading out.

AFD Canary Cap Com, AFD.

CYI Houston, Canary Cap Com.

AFD Roger, when you acquire the Agena you'll have
the ACS on, geo rate on, horizon sensors on,
it will be configured for 0, 0, 0 and flight
control mode 1. They tried to set the thing
up to see if they could stabilize it with a
little bit of ACS gas that might possibly be
remaining in there but they said they didn't
have any success.

CYI Okay, we'll take a look at it.

Gemini Control Houston, we've had LOS over Bermuda. The next
station to acquire will be Canary and it appears from the
discussion that Gemini 12 crew will perhaps make a real-time
decision as to exactly when to depress for their second
standup EVA. They indicated they were GO for depress. This

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would move it up from what the time that we're initially
talking about, and this would be at 1 revolution later.
So it has become a Gemini 12 crew option. Standing by this
is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 65 hours, 51 minutes now. We're approaching acquisition with Canary and we're standing by.

Gemini Control Houston.

Gemini Control Houston. We're coming up over Canary now. The hatch has not been opened yet and the cabin has not been depressed yet but we're standing by to see what transpires.

S/C Roger, understand. We'll close the hatch after we've taken the pictures.

HOU Canary Cap Com, Houston Flight.

CYI Go ahead Flight.

HOU How do they look?

CYI Okay, looking good so far. They haven't depressed.

HOU Okay. The O₂ pressure up okay?

CYI Roger.

HOU You're go for depress then, huh?

CYI As soon as he finishes his suit integrity check.

HOU Roger.

HOU Canary Cap Com, Houston Flight.

CYI Go ahead Flight.

HOU You see the integrity of the check, send us the decay numbers post-pass.

CYI Roger.

Gemini Control Houston still standing by.

Gemini Control Houston still standing by as we have some two

minutes left in this pass over Canary.

HOU Canary Cap Com, Houston Flight.
CYI Go ahead Flight.
HOU Gemini main and bravo.
CYI Roger.
CYI Okay, Command Pilot's suit is being pressurized
 at this time. I'm seeing integrity check.
HOU Roger.
CYI Gemini 12, Canary Cap Com. About a minute to
 LOS. Your suit integrity check is good. You've
 got a go for depress.
S/C Roger, understand. Go for depress.

Gemini Control Houston. You just heard the Canary Cap Com
advise the Gemini 12 crew that they have a go for depress.

HOU Kano go remote. Canary go local.
KNO Kano's remote and we have acquisition.
HOU Gemini 12, Houston Cap Com through Kano and
 standing by.
S/C Roger, we're just about ready to depress.
HOU Mighty fine. We'll be giving you exercises
 over Carnarvon.
S/C You'll be what?
HOU You'll be doing the exercise over Carnarvon.
S/C Yeh, okay. I forgot about that.

Gemini Control Houston. The exercise referred to there was the arm lifting activity, lifting the arms to the helmet on the part of Pilot Buzz Aldrin during his extravehicular activity, the second standup EVA. At 66 hours, one minute now into the mission, we're over Kano and we're standing by.

Gemini Control Houston. About two minutes to go on this pass over Kano and we're standing by as the Gemini 12 crew is no doubt quite busy at this time.

HOU Gemini 12, Houston Cap Com. One minute to Kano LOS. Have fun. Be 22 minutes to Carnarvon.

S/C Roger, Houston. We're going down now. We're ... psi.

HOU Roger, understand.

Gemini Control Houston. Gemini 12 advises that their depressing now. They're down to 1/2 psi cabin pressure.

HOU Gemini 12, Houston at Kano LOS. Reading you on VOX.

KNO Kano has LOS.

Gemini Control Houston. We've just had LOS at Kano. The next station to acquire will be Carnarvon. This is at 66 hours, 26 minutes, 40 seconds into the mission or some 20 minutes from this time.

The Surgeon advises that heart rates for the crew during this period - this period of depressurization ranged from 50 to 70, which is an

amazingly low figure but considering the heart rate pattern that we've seen throughout this mission it does not come as a surprise. Also, we have witnessed here a real time option exercised by the crew as to the start time of their second standup EVA. Initially, we had planned to pass up a fixed time some revolution later from the ground but in discussing the EVA preparations with the crew, Bill Anders after consulting with Flight Director Cliff Charlesworth, came back and indicated to them that they should go with their option. This they have done. So at 66 hours, 7 minutes into the flight of Gemini 12, this is Gemini Control Houston.

END OF TAPE

Gemini Control, Houston, 66 hours 26 minutes now into the mission. We're approaching acquisition at Carnarvon and we're standing by.

SC That one I think may be illuminating the hatch a little.

SC Right.

SC (garbled)

LOVELL Say again, Orion is up there now, Buzz I'm sure.

SC It was a lovely show of the jettison.

CRO Gemini 12, Carnarvon.

SC Go ahead.

CRO Okay, we're waiting for a little bit of solid sync on telemetry and then we'll have Buzz's exercise started, okay?

SC Okay. Thanks for the DPS burn.

CRO That is to let you know we are here.

LOVELL Take a picture of it Buzz as we head towards it.

SC Carnarvon, 12.

CRO Go ahead

SC Are your batteries - thrusters firing now?

CRO That is negative.

SC We do have a continual firing whenever Buzz moves around in the

CRO Okay, we're showing intermittent 3 and 4.

SC That is right, 3 and 4 keep (garbled)

LOVELL When he does the exercise it is really going
 to open up.

SC Is 4 firing?

SC (garbled)

CRO Well the solenoid is opening, I don't think it
 is doing much firing.

CRO Okay, 12, anytime you are ready, we are ready
 for Buzz's exercise.

LOVELL Okay.

ALDRIN One more picture of Orion.

ALDRIN Want to hold the camera?

LOVELL Yea.

ALDRIN Don't touch the (garbled)

SC (garbled)

ALDRIN Okay, I got it.

LOVELL Must have been a circuit breaker Buzz.

LOVELL Firing it again

ALDRIN When you are ready.

LOVELL Okay, I will give you a MARK and you can start
 whenever you are ready Buzz. Are you all set.

ALDRIN Right.

LOVELL MARK

 You ought to get a look at both thrusters Buzz.

ALDRIN Ready to go.

SC Exercise

CRO Flight, Carnarvon

HOU Go

SC Standby, MARK

HOU Go ahead

CRO Roger, shouldn't he be on the B pump.
Showing on A on both (garbled)

HOU Standby.
It is okay we are satisfied with that.

CRO Okay.

ALDRIN Can't really get my arms down to far, the
motion that I am going through is comfortable.
but I do have to squeeze my legs a little
bit to keep from going up.

CRO Would you see how many pictures are left in
there now?

LOVELL Check.

ALDRIN Have you already turned on the flashlight?

LOVELL I just turned it off in here.
(Long pause) There is about 28 or 30 in here
yet. Here is the camera again. Okay, you've
gone your two minutes, let's see, can you
get anymore of Gamma Velorum?

ALDRIN (garbled)
I think it's in better position now.

LOVELL As a matter of fact I think it is up a bit
ahead isn't it?

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LOVELL No wait a second,
ALDRIN No it's
LOVELL Yea, I'm looking at Schedar.
ALDRIN The one in the middle is Jupiter
LOVELL Yea Jupiter. that is what I was looking at,
 thinking it was Sirius.
ALDRIN (garbled)
HOU Carnarvon from Flight, Agena LOS main.
CRO Roger
CRO 12, Carnarvon. One minute to LOS and standing
 by.
SC Okay, exercise is complete.
CRO Roger, thank you.
CRO Carnarvon has Agena LOS
SC Exhibit this, one handed now.
CRO Roger
SC (garbled) burn
 Let's see, sunrise at 47, we're 35 now.
 66:47 and it's 66:35. About 12 minutes.
 You want to start shooting them before sun-
 rise you know.
ALDRIN They want to catch it as it's coming up (garbled)
CRO Carnarvon has LOS Gemini. All systems
 GO at LOS.

Gemini Control Houston, 66 hours 36 minutes now into the flight of Gemini 12. We picked up the Gemini 12 crew over Carnarvon while Buzz Aldrin was performing his exercises. This is where he moves his arms up toward the helmet. It was indicated by their conversation that they had already shot photographs of the - of Orion this is with the - utilizing UV S-13 camera. The conversation at the tag end of our pass over Carnarvon indicated that they were looking forward to a sunrise time. They plan to take pictures of the sunrise with the S-13 camera. The heart rates during this pass on Buzz Aldrin read this way, during his photographic time heart rates ranged from a low of 82 up to 90. Respiration 16 to 18. During his exercise period, we had a peak of 105, which was considered quite normal. Respiration rate of 16. The total duration of this standup EVA is much like the real-time option which was exercised, we expect the hatch to be opened approximately 1 hour but we will have some latitude as far as duration. So at 66 hours 38 minutes and out of range with Carnarvon now, the next station to acquire will be Canton, this is at 66:49:28 we pass close to the outer edge of the ring of acquisition, but we will standby for any conversation over Canton. This is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 66 hours, 49 minutes now into the flight of Gemini 12. The Gemini 12 spacecraft is now approaching acquisition with Canton. This will be a short pass on the outer ring of the Canton tracking station, some three minutes -- two to three minutes on this pass and we're standing by for any conversation which might occur.

Gemini Control Houston. We're still standing by. There has been no conversation during this pass. We've only got 30 seconds to go before we lose acquisition with Canton; however, all appears to be going well in the mission at this time. This is Gemini Control Houston.

This is Gemini Control Houston. 66 hours, 52 minutes into the mission now. We're out of range with Canton at this time. Because of the short duration of the pass and the fact that we just tipped the outer ring of acquisition, Cap Com Bill Anders chose not to try to contact the crew during this pass. Our next station to acquire is Guaymas, this is at 67 hours, 6 minutes, 17 seconds into the flight of Gemini 12. We have a nominal flight plan displayed here now which indicates that close hatch and repress time would be at 67 hours even. However, there is some flexibility that can be exercised on the part of the crew in this regard. So at 66 hours, 53 minutes, 44 seconds, this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 67 hours, six minutes into the mission now. We're just coming up on Guaymas at the tail end of our 42nd revolution. Cap Com Bill Anders is trying to reach the Gemini 12 crew now.

HOU Roger, you got the cabin repressed?

S/C Roger, 3 psi now...

HOU Roger, understand 3 psi.

S/C We've got a little leg room here for a change.

Yeah.

Now we're known as the litterbugs, right?

Oh my, now we'll see what's next on the docket.

HOU Keep space clean.

S/C going to have a fit trying to stack all these little bits and pieces.

Okay, we're four and a half.....

HOU Texas go remote, Guaymas local.

TEX Texas remote.

S/C LOVELL Okay, cabin repress is going fine, up to 5 psi.

Okay, radiator's going to flow. Secondary coolant valve circuit breaker closed.

ALDRIN Did we report that

LOVELL Oh yeah, we have the A pumps on, that's right.

S/C Houston, 12.

HOU Go ahead, 12, Houston here.

S/C Let's see, that was pretty expensive in the area of the way of fuel. It was about 25 to 30 percent.

HOU Copy. When you get relatively squared away we've got some stuff for you. Give us a call.

S/C Okay.

Are you pretty well squared away?

.....garble

HOU Gemini 12, Houston Cap Com, suggest you go off VOX.

S/C Roger.

HOU Gemini 12, Houston. TM shows thruster 4 on continuously. Will you confirm that thruster 4 circuit breaker is off.

S/C Yes, it's off. During EVA, I turned it off. We had quite a bit of ... and we wanted to see if there was fuel ... firing from thruster 4 to see if we'd turn it off it would stop firing. Putting it back on.

HOU Roger.

S/C Houston, 12. Did you want to give us some flight plan updates?

HOU Roger, 12. If you got time, we'd like you to start a normal purge, section 1 and then 2.

S/C Roger, starting normal purge, section 1 and then 2.

HOU Roger and when you get squared away we'd like to have you start a D-10 Mode Alpha, followed by a Mode Echo.

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S/C Roger. After EVA is squared away, D-10 Mode Alpha then Echo. Any particular time for that?

HOU No particular time. At your convenience. You can also go ahead and eat. We'll give you a flight plan update next time around on the ETR, over the U. S. at 68:39.

S/C Roger, next flight plan update 68:39.

HOU Roger, and if you want to get your next station time up to date you can add five minutes to what you have on the flight plan.

S/C Roger.

HOU I have a node update, if you'd like - have time to copy that.

S/C Okay.

HOU Time 68:30:11, node rev 43, 155.9 west, right Ascension, 10 hours, 26 minutes.

S/C Roger.

HOU Okay, is there anything you would like to add to the jettison list.

S/C Stand by one.

S/C We threw away the S-13 bracket, and there is a possibility we threw away both cables to the left-hand EV camera. We kept the gold visor, the EV visor.

HOU You kept the EVA visor?

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S/C Right.

HOU And everything else went out the door?

S/C Roger.

HOU Roger, we have the rest of these PLA updates whenever you're in the mood to copy them, but they're not critical.

S/C I'll copy them now. We wrapped everything up.

HOU Roger, starting with 46 dash 4 Alpha, 72:50:31...

END OF TAPE

HOU ...4 Alpha. 72 50 31, 20 + 47, 26 + 31, roll left 85, roll right 95. 47 - 4 Alpha, 74 26 07, 20 + 41, 26 + 17, 48 - 4 Bravo, 76 01 48, 20 + 18, 25 + 56, Bank angles are all the same, weather is all good.

S/C Roger.

HOU And we'd like to have Buzz press on the sternal EKG sensor if he has a chance.

S/C Roger. Which one is that?

HOU That's the one on your breastbone.

S/C Okay.

HOU It's right in the middle of your sternal.

S/C Houston, illegible.

Is that going to be it?

HOU I'll have to wait a second. Roger, thanks a lot, that helped and be advised you're about 120 miles from the Agena and holding your own.

S/C Roger.

HOU Gemini 12, Houston. How is your purge going? Mighty fine.

Gemini 12, Houston, over.

S/C Roger.

HOU Roger, just as a matter of info, we'll be planning various modes of D-10 later on in the day, which you can just give a try; if you have any trouble with it, we'll just have you

go -- pass on to the next one. We'll also be trying S-11 and S-29 and some T-2. We'll give you detailed update next time around.

S/C Roger, Houston. Just keep in mind all these require a plane stance, can be done if you take your time, otherwise you just do the job or you use a lot of gas doing it.

HOU Roger, we are considering that and we'll give you a long time for each mode and you'll just have to do the best you can.

... LOS on Gemini, ...

HOU Gemini 12, Houston.

S/C Go ahead.

HOU Roger. Just as a reminder, when you're doing D-10, mode echo, we don't want you to fire your up-down or right-left thrusters.

S/C Roger.

GTI LOS Turk.

S/C Purge complete.

HOU Copy.

Gemini 12, Houston Cap Com. One minute to LOS.

Canarys in three minutes.

Gemini Control Houston, 67 hours, 24 minutes now into the flight of Gemini 12. We have concluded our third EVA of this

mission, the second standup EVA programmed for Gemini 12. The Gemini 12 crew, Jim Lovell and Buzz Aldrin, had closed their hatch prior to acquisition at Guaymas. The exact time, or duration of this EVA has not yet been refined; however, to recap quickly, we -- the Gemini 12 spacecraft had its hatch opened after Kano, and before Carnarvon. We picked up Buzz Aldrin during his exercise period over Carnarvon, and the hatch was closed sometime prior to acquisition at Guaymas. The Gemini 12 crew has just been updated by Cap Com Bill Anders. During this next revolution, they will perform the D-11 experiment. This is the ion sensing attitude control experiment. The crew will then, at their leisure, eat. They expect a second flight plan update at 68 hours, 39 minutes, a flight plan update over the Eastern Test Range. The crew appears in very good spirits as they have extended their already existing EVA record, and at 67 hours, 26 minutes, we are standing by now -- standing by for acquisition momentarily at Canary. This is Gemini Control Houston.

CYI Canary has TM solid on the Agena. Agena is
go.

HOU Roger, Canary.

END OF TAPE

CYI And we have TM solid on the Gemini. And it
is also go. Cabin pressure is still down,
about 4.6.

HOU What are you reading on cabin pressure, Canary?

CYI 4.6 off the meter.

HOU Okay.

CYI Gemini 12, Canary Cap Com. We will send you a
TX at this time.

S/C Roger.

CYI Houston Flight, Canary Cap Com.

HOU Go ahead.

CYI Okay, the inverter temperature on the Agena is
Charlie, Oscar 21, is reading 132 degrees.

HOU Roger, 132.
And that's what it was over the States.

CYI Okay.

HOU And that's why we turned the ACS off, Bill.

CYI Okay.
The cabin pressure is 4.68 now.

HOU Okay, EECOM advises that with the repress off
it's going to take a couple of hours to build
that up.

CYI Okay.

HOU No sweat.

CYI Roger.
Flight, Canarys.

HOU Go ahead.

CYI Okay, we're reading 768 on the O₂ tank pressure.
Do you want to bump that up a little bit or..

HOU Seven what?

CYI 768.

HOU No that's okay.

CYI Houston Flight, Canary Cap Com.

HOU Go ahead.

CYI Okay, on the Agena S-band temperature HO/49 has
gone up 2 degrees since it left the States. It's
reading 144 now.

HOU Okay, 144.
Canarys, Flight.

CYI Go ahead, Flight.

HOU We're not worried about that S-band temp at this
time. We'll continue to watch it though.

CYI Okay.

HOU Canarys, Flight.

CYI Go ahead.

HOU Ask Jim if he has deployed the D-10 sensors yet.

CYI Roger. Gemini 12, Canary Cap Com.

S/C Go ahead, Canarys.

CYI Have you deployed the D-10 sensors yet?

S/C Just a second and we'll let you know. We're
still doing the EVA post-stowage and you'll
have to wait for it.

HOU No, no, no hurry, okay.

CYI Stand by, stand by on that, 12.

HOU No hurry, that's okay. We just wanted to know.

CYI There's no hurry on it. Do it at your convenience.

They just wanted to know back in Houston.

S/C Roger.

CYI And we have about a minute to LOS, here. We'll stand by.

HOU Kano, go remote.

CYI Canarys local.

KNO Kano is remote and we have acquisition.

HOU Gemini 12, Houston Cap Com through Kano.

S/C Roger, Houston.

HOU Roger, on the D-10 deploy/^{it} and activate mode Echo on your convenience.

S/C Roger.

HOU Gemini 12, if you are calling Houston, we're not reading you.

S/C Houston, 12 here. We are not calling.

HOU Roger, read you five by. You copy that comment on D-10?

S/C You said there was no hurry to deploy D-10, is that correct?

HOU Deploy D-10, mode Alpha and mode Echo at your convenience.

S/C Roger, will do.

S/C Houston, 12 here.

HOU Go ahead, 12.

S/C We'd like for you to confirm that the number 12
forward firing thrusters will not effect the D-10.
I haven't used it yet, but we probably will be
using them for yaw control.

HOU That is affirmative. The forward and aft firing
thrusters will not effect D-10.

S/C Roger.

HOU Gemini 12, Houston, how did the EVA photography
go?

S/C Well, it was a little bit difficult to get the
shots of the sunrise. They were kind of back
angle shots around the hatch underneath the
hatch-closing device. So we ended up taking all
frames of the UV film and I think we out to get
some fairly good pictures out of it.

HOU Sounds real good. Nice going.

S/C (garbled)

HOU Say again, 12.

S/C Do you think you could see Orion in the daytime?

HOU Oh we think we might on UV film, if the camera
didn't see any of the spacecraft.

S/C Well, it was kind of hard after sunset, but after
sunrise, the sun was shining on the back of the
adapter and I think I might have been able to

get the Gamma Velorum area, but the Orion area

I'm pretty sure was getting some...

END OF TAPE

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S/C I think I might have been able to get the
gamma Velorum area but the Orion area, I'm
pretty sure was getting some scattering from
the spacecraft.

HOU Roger. Anywhere up there would be great.

HOU Gemini 12, Houston Cap Com, over.

S/C Go ahead.

HOU Roger, if you don't object we'd like to have
you go to the primary scanners for the rest of
the day and back to secondary tomorrow.

S/C Very well, we're on primary.

HOU Mighty fine.

S/C What we're trying to do is the horizon scanners
in orb rate of the platform to see what it does.

HOU Roger.

(PAUSE)

Gemini Control Houston. We're in the final stages of our pass
over Kano. There's one minute to Loss of Signal at Kano. We're
standing by for any further conversation which might take place.
This is Gemini Control.

HOU Gemini 12, Houston Cap Com, one minute to LOS.
Five minutes to Tananarive.

KNO Kano has LOS.

Gemini Control Houston. We've just had loss of signal over

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station. Tananarive will acquire at 67:47 into the flight of Gemini 12. At the present time the Gemini 12 spacecraft with its crew of Jim Lovell and Buzz Aldrin is in its 43rd revolution. The apogee on the spacecraft is now 157.9 nautical miles and the perigee reads 142.8 nautical miles. This is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 67 hours 47 minutes now. We've just acquired Gemini 12 at Tananarive and we're standing by for conversation with the crew.

HOU Gemini 12, Houston standing by at Tananarive.

SC Roger we have completed mode A, we are in the process of mode B.

HOU Roger.

Gemini Control Houston, very little conversation during this pass over Tananarive. Here in Mission Control, Astronaut ~~Gordon~~ Cooper has come in to perhaps spell Bill Anders for awhile in the Capsule Communicator duties. He is at the console now and is chatting with Anders.

HOU Gemini 12, Houston Cap Com. One minute to Tananarive LOS, 9 minutes to Carnarvon.

Gemini Control Houston, 67 hours 55 minutes now. We've had loss of signal with Tananarive. The next station to acquire will be Carnarvon. Our pass over Carnarvon is scheduled for 68 hours, 2 minutes, 1 second into the flight of Gemini 12. As we start over the hill on our 43rd revolution this is Gemini Control Houston.

END OF TAPE

Gemini Control Houston, 68 hours, two minutes now into the flight of Gemini 12. Jim Lovell and Buzz Aldrin are approaching acquisition at Carnarvon tracking. We expect little or no conversation during this pass, by the way. Carnarvon advises that they are standing by.

CRO Flight, Carnarvon

HOU Go ahead.

CRO I'm showing both A pumps on in loops, both
A pumps and B pumps.

HOU Say again.

CRO I say we're showing the A pumps on in both
loops. Stand by. Go ahead, 12.

S/C Check of our thrusters indicate no. 8 thruster is
also out. I guess the last plat mode operation
was too much for it. We can still see the thing
firing but trying to operate it we found out we
get no response from no. 8 at all.

HOU Okay, that's thruster no. 8, is that right?

S/C Roger, OAMS thruster no. 8.

HOU Okay, copy that.

CRO Flight, Carnarvon.

HOU Go ahead.

CRO Does he need his computer for this D-10?

HOU Yeah, I think he does need it for the first

part.

CRO Okay, it's showing off right now.
Did you get that comment on the A pumps
being on also?

HOU Yes.

CRO Okay.

HOU That's because they're powered up, Jim.
Leave it that way.

HOU The computer's off and that's appropriate,
Carnarvon.

CRO Say again, Flight.

HOU The computer being off is appropriate for
this mode.

CRO Okay.. We're showing quite a bit of activity
on pitch up and yaw left.

HOU On the spacecraft?

CRO Roger.

HOU Yeah, working.

CRO He just opened up his maneuver thruster circuit
breaker.

HOU Maneuver thruster did you say?

CRO Rog.

HOU All of them or one of them?

CRO All of them.

HOU He's probably troubleshooting and trying to find

something that works.

CRO Rog.

CRO Okay, he just opened up 5 and 6, 1 and 2, 3 and 4. Attitude is now 80 - closing back up.

HOU Okay.

CRO And he's really firing 5, 6, 1 and 2. Pitch up and pitch down.

HOU Rog.

S/C Carnarvon, Gemini 12.

CRO Go ahead.

S/C Roger. It seems like right now we go unstable in plat control mode.

CRO Roger. He's in pulse right now, Flight.

HOU He's in pulse?

CRO Right now he's in pulse, right. He says he's unstable in platform mode.

HOU Yeah. That's cause he doesn't have any yaw going for him except one thruster.

CRO Yep.

CRO And we've had LOS Gemini and Agena.

HOU Roger Carnarvon.

This is Mission Control Houston. We have had loss of signal at the Carnarvon, Australia tracking station. The next event at the Press Center is the Change of Shift Briefing from the green

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team. The participants will be Dr. Charles A. Berry; Mr. William Schneider who is Mission Director for Gemini 12; Jerry Griffith, the Guidance Navigation and Control Engineer for the green team; and green team Flight Director Clifford Charlesworth. This Press Conference should get underway in a few minutes. At 68 hours, 11 minutes and 33 seconds after liftoff this is Mission Control, Houston.

END OF TAPE

This is Mission Control Houston, coming up over the Canton Island Voice Remoting Station. We've just had acquisition at Canton Island. We will standby for any conversation between spacecraft communicator here in Mission Control and the crew of Gemini 12. Let's listen in.

HOU Gemini 12, Houston Cap Com, through Canton and standing by.

SC Roger, Houston. Did you get the word from Carnarvon on some addresses?

HOU Roger, we were monitoring your Carnarvon pass and we'd like to make sure you got your roll jets in pitch.

SC Roger.

HOU Would you confirm that your OAMS heater circuit breaker is on?

SC Roger, OAMS heater circuit breaker is on.

SC We are now dutifully performing mode F of the D-10.

HOU Roger, we might be doing some more of that if this keeps up.

SC (garbled)

HOU Seems like you've been in this situation before, Jim.

SC We had little problem with two delta P lights up here.

S/C HOU Roger, just like being back home again.
HOU Gemini 12, Houston. We're still thinking of
having you try the other mode on D-10 to see
how you can - how it will work out, but if
you can't hack it why you can always give foxtrot a try.

SC Well we attempted to (garbled) SEF but we
weren't to the right mode (garbled) and
couldn't even do it without (garbled) we
got the rates down but the plat wouldn't
hold it.

SC (garbled)

HOU 12, Houston. You're fading in and out.
We'll dump you more over the states. Be advised
that if you are still drifting you might to
get some pictures over Mexico and Florida, the
weather is pretty good.

SC Roger.

HOU Gemini 12, Houston Cap Com. About one minute
to Canton LOS. See you at Guaymas in 11 minutes.

SC Roger.

This is Mission Control Houston at 68 hours 30 minutes and 39
seconds after liftoff. We have had loss of signal at the
Canton voice remoting station. Coming up on Guaymas in approxi-
mately 10 minutes. This is Mission Control Houston. Now to
the Press Conference.

END OF TAPE

This is Mission Control Houston at 69 hours 12 minutes and 35 seconds after liftoff. Gemini 12 at the present time is over the Kano, Nigeria voice remoting station. During the just completed stateside pass the crew was given flight plan updates for the days activities. Up through the sleep period. Included several runs of experiments, they were given a GO for landing area 60-1 which is the normal end of mission landing. They also reported, the crew reported, that number 8 thruster was out. They were now in drifting flight. We have an accumulation of tape of the air to ground transmissions which we will play back now. They will include the stateside pass, the Canary Islands pass, and the Kano, Nigeria pass presently under way. At the completion of that we will pick up whatever transmissions are made during the Tananarive voice remoting station pass. Let's roll the tape now.

CAL California has acquisition.

FD California go remote.

CAL California is remoting.

HOU Gemini 12, Houston. Over.

FD Guaymas go remote, California local

GYM Remote

HOU Gemini 12, Houston Cap Com, over.

SC Roger, Houston.

HOU Roger 12. Our calculations here on the ground

indicate that you're probably approaching an empty adapter water tank here shortly. You'll be able to tell this because the water pressure will drop from about 20 psi which you've been having to almost nothing. You'll have to use a squeeze bulb to get water out of the spacecraft tank. You have about 13 pounds in the spacecraft tank. When you notice this drop in water pressure, we'd like for you to get a gun count. Over.

SC Thanks a lot. Okay, we'll give you a gun count.

HOU Okay, you faded on us on your description of the control situation over Canton, could you give us a run down?

SC Roger. Number 8 thruster appears to be out. We can hear the solenoids firing but it doesn't do anything. Very similar to a situation that we had back on 7. We tried to align the spacecraft SEF after we realigned the Scan Mode and when we got back there we went back to the Plat Mode and it started to put vibration on it so we got out of it again. To save fuel, we just went adrift. We're drifting now.

HOU Okay. Sort of like Gemini 5 control power.

SC Yes, this looks like another one.

HOU Gemini 12, Houston. Could you give us a
water gun count now please?

SC Roger, our water gun is looking at
2024.

HOU Copy, 2024. I have a flight plan update
for you when you are ready to copy.

SC Ready to copy, go ahead.

HOU Roger. We have a - several D-10 modes here
for you. We'd like for you to try them,
recognizing your control problem. If you
would do the best you can, if you can't get
it you might move on to the next mode. If
you have - if you can't get them at all just
go ahead and do fox trot. Okay the first one
69 30, D-10 Mode Bravo, end it at 69 40.
At 69 55, D-10 Mode Bravo, end it at 70 05.
At 70 05, start a D-10 Mode Charlie, end it
at 70 30. 70 45, S-11 Mode Charlie; 71 20
to 72 20, D-10 Mode Charlie; 71 55, purge
fuel cells, section 2 then section 1; 72 20
to 73 20, D-10 Mode Dog; 73 20 align platform,
also D-10 Mode Echo, do that until 73 45;
73 45 S-29; 74 20 power down platform; 75 00
X-ray on Beta with mag through sleep period;
75 18, T-2 Mode Alpha, sequence 1;

75 50 eat period; 76 06 CSQ, PLA update block
eight, purge fuel cells, section 1 then section
2. Give us a cryo read, leave cryo read in
H2 for sleep period; 76 25 Hawaii, crew status
report, H2 heater on, raise pressure to
667 pounds, H2 heater auto; 76 30 to 84 30,
sleep period, also D-10 Mode Fox trot, did
you copy?

Did you copy Gemini?

SC Roger, I think I got most of that. Would
you say again at 75 18 please?

HOU 75 18, T-2, Tango 2, Mode Alpha, sequence 1.

SC Roger, and then the pressure for the H2 heater
before going to auto.

HOU 667 pounds.

SC Roger, 667.

HOU And we are ready for a 30-second O2 purge on
both sections.

Gemini 12, do you copy O2 purge?

SC Negative, say again please. Didn't get any of
that.

HOU Roger, we'd like to have you do a 30-second
O2 purge for both sections.

SC I understand, 30-second O2 purge both sections
now.

HOU Roger and we'd like to update your TSR and
give you a load for 16-1. Would you turn
your computer to prelaunch?

SC Roger, computer is prelaunch, it's on,
standby for a diagnostic.

HOU Make that 60-1.

SC Okay. Looks like on the purge I get an
indication on the FDI needles in detent.

HOU Roger, we'll have ECOM and G & C think about
that.

SC It showed a yaw to the right.

HOU Roger.
Gemini 12, Houston. We understand that you
are able to get 1 T-2 pass, do you have any
data for us?

SC Roger, standby just a minute.

HOU Okay.

SC I wouldn't worry about that FDI needle moving to
much, that accounts for the fact before I put
that one on.

HOU Copy and you are go for 60-1.

SC 60-1, roger.

HOU You got a good load and we're done with the
computer.

SC Done with the purge?

HOU Roger, copy, done with purge.

SC (garbled)

HOU Roger, standby we are reading you quite
garbled.

FD Bermuda go remote

BDA Bermuda remote.

HOU Gemini 12, Houston Cap Com. We are ready
to copy your T-2 data.

SC Roger, I will omit the times, I don't - unless
you really want those. The zero bias, 0000.....

END OF TAPE

Aldrin Roger, I'll omit the times, unless you really want those. 05 00 01, I'll give you just the last two digets, number 2 was 02, number 3 was 59, number 4 was 50, number 5 was 01. Did you copy?

CAP COM Roger, we copy, thank you.

Aldrin Roger, I've got several readings here, 18.611, I'll give you the last two digits on the remaining ones, number 2 was 06, number 3 was 04, number 4 was 08, number 5 was 04, number 6 was 04, number 7 was 09, number 8 was 06, number 9, I inadvertently turned the knob, number 10 was 08, number 11 was 11 and for the last three I switched to a slightly different using the thumb instead of the finger to turn the knob, and I got 05 for all three of them.

CAP COM Roger, we copy.
Gemini 12, Houston. You have a good load, you are cleared out of prelaunch at your convenience.

Aldrin Roger.

CAP COM Gemini 12, Houston Cap Com, over.

Lovell Go ahead.

CAP COM Roger, could you give us your first and last T2 time please?

Aldrin Roger, the times are reference to 63 hours 14 minutes, 42 seconds, now wait a minute

Aldrin the times are reference to 63 hours, 6 minutes, 00 seconds. First measurement was at 13 00 8.0 and the last measurement was at 38 51.0.

CAP COM Roger, copy.
Gemini 12, Houston Cap Com, one minute to LOS, five minutes to Canaries.

S/C Roger

HOU FLT CYI, Flight

CYI Go ahead, flight.

HOU FLIGHT Standing by for your pass, Bill.

CYI Ok.

HOU FLT And no special requests.

CYI Roger. Acq aid contact on the Agena. We are getting TM out of Gemini now, its rather ragged at this time.

HOU FLT Roger

CYI Gemini 12, Canary Cap Com. We have nothing for you at this time, we are standing by, sending a TX at this time.

S/C Roger, CYI.

CYI Flight, Canary.

HOU FLT Go ahead.

CYI (Garbled)

S/C Looks real nice down there.

CYI Say again, 12.

S/C I say it looks real nice down there.

CYI It is, very very nice.

CYI Gemini 12, Canary Cap Com. About a minute to
LOS. We are standing by and we will see you
tomorrow.

Lovell Roger, Canary.

CYI We've had LOS on the Agena. And we've had
LOS on the Gemini.

HOU FLT Roger, Canaries.

CYI And we'll see you tomorrow.

HOU FLT Ah that's right. Time off, huh?

CYI That's affirmative.

HOU FLT Have a good night, Bill.

CYI Roger will do. It's starting to get dusk over
here.

HOU FLT That sounds like a good time to get off.

CYI You're right. It's almost like bankers hours
this mission.

HOU FLT Sure, you and Carnarvon.

CYI I don't think Jim appreciates that.

HOU FLT OK, we'll see you tomorrow.

CAP COM Gemini 12, Houston Cap Com through Kano, and
standing by.

Lovell Roger, Houston. Mode C....I don't think...
we have any capability of a compass.

CAP COM Roger.

CAP COM Gemini 12, Houston Cap Com, over.

Lovell Go ahead, Houston.

CAP COM Ok, Jim. If you can't do mode C, try to stay generally SEF heads up.

Lovell Roger, we just got it out of that position now, we were very fortunate..just..to stop it. We can maintain this position somewhat but if we try to do any particular maneuvers, we just yaw all....

CAP COM Roger, we copy.

Gemini 12, Houston Cap Com, over.

Lovell Roger, Houston.

CAP COM On the S-11, if you don't think you'll be able to swing around to the horizon, just take about 12 pictures of whatever horizon you can get.

Lovell Roger, understand.

CAP COM Gemini 12, Houston Cap Com, one minutes to Kano LOS, five minutes to Tananarive.

HOU Tananarive, go remote.

TAN Tananarive, remote.

CAP COM Gemini 12, Houston Cap Com through Tananarive, over.

Gemini 12, Houston Cap Com through Tananarive, over.

Gemini 12, Houston Cap Com, through Tananarive, over

END OF TAP

HOU Gemini 12, Houston Cap Com through Tananarive,
over.
Gemini 12, Houston Cap Com through Tananarive,
over.

SC Roger, Gemini 12. Go .

HOU 12, this is Houston Cap Com reading you somewhat garbled. Be advised we have talked to the D-10 experimenter. He feels that if you can hold attitudes within plus or minus 20 degrees, 20 degrees, at the various mode data, would be acceptable. If not, go to Mode F, Mode Foxtrot and do S-5, S-6, and S-29 as targets of opportunity. Over.

SC I understand that if we can do D-10 right now after attitudes of 20 degrees it would be acceptable. (garbled) S-6, S-5 and S-29 as targets of opportunity. Is that correct?

HOU Roger, that is S-5, S-6 and S-29 and D-10 Mode Foxtrot.

SC Roger. We don't (garbled) pulse mode B, I'll let you know how we come out.

HOU Roger. We'd also add S-11 as target of opportunity also.

SC S-11.

HOU Whatever you can get, we'll take it.

 One minute to Tananarive LOS.

 Nine minutes to Carnarvon.

SC Say again.

HOU One minute to LOS and nine minutes to Carnarvon.

SC Roger.

TAN Tananarive LOS.

This is Mission Control Houston at 69 hours 35 minutes and 22 seconds after liftoff. Spacecraft Gemini 12 is within about 2 minutes of acquisition by the Carnarvon, Australia tracking station. We'll come back up with that pass, the pass duration will be 8 minutes and 40 seconds over Carnarvon. To briefly summarize the stateside pass the crew of Gemini 12 were given a GO for landing area 60-1, the flight plan update for the entire day up through the sleep period. The sleep period is scheduled to begin at 76 hours 30 minutes and run through 84 hours 30 minutes ground elapsed time. During the sleep period the D-10 experiment will be turned on in random mode, random data and drifting flight. Also, they were given several runs of the D-10 in other modes for yaw and roll attitude measurements of this Ion-Sensing Attitude Control Experiment. One run - one sequence of the T-2 sextant space sextant experiment was passed up to the crew. This is scheduled to take place at 75 hours 18 minutes ground elapsed

time and it will be a measurement of between the stars Betelgeuse and Rigel. Carnarvon now has acq aid contact and telemetry contact with Gemini 12. Both systems are go on the ground. We are awaiting for spacecraft communicator at Carnarvon to put in a call to the spacecraft. Carnarvon is standing by, let's listen.

CRO Gemini 12, Carnarvon standing by.

SC Roger, Carnarvon. We are still doing D-10 Mode B, with respect to our control system, I think that the experiment is coming along quite well and it gave the proper response on the pilot side.

CRO Okay.

CRO C and S-Band track at Carnarvon.

HOU How is the S-band temperature.

CRO Standby.

144 degrees.

HOU 144 roger.

HOU Carnarvon is the computer on?

CRO That is affirmative.

HOU Would you send us a couple of OBC's?

CRO Roger, we have.

HOU Really makes him happy.

CRO I can imagine.